FAU
BOARD OF TRUSTEES
Florida Atlantic University

Item: AS: A-4

COMMITTEE ON ACADEMIC AND STUDENT AFFAIRS

Tuesday, April 20, 2021

SUBJECT: REQUEST FOR APPROVAL OF A NEW DEGREE PROGRAM (CIP 26.1501)

PROPOSED BOARD ACTION

Request for approval of the following new degree program: Ph.D. in Neuroscience (26.1501).

BACKGROUND INFORMATION

The proposed new Ph.D. in Neuroscience seeks to prepare students for high-demand, research-oriented positions in academia and industry that ultimately seek to understand, diagnose and treat devastating brain disorders including autism, addiction, depression, stroke and Alzheimer's disease. The program, administered by the FAU Brain Institute in coordination with the Charles E. Schmidt College of Science, involves the efforts of more than 60 research-active faculty from five FAU colleges (Science, Medicine, Engineering and Computer Science, Education and the Wilkes Honors College) as well as FAU-affiliated faculty from two premier research institutes - Scripps Research Florida and the Max Planck Florida Institute for Neuroscience - to offer a one-of-a-kind opportunity for trainees to pursue doctoral training that spans molecules, systems, and biomedical dimensions of neuroscience. External scholars are hosted on campus each year for multi-day visits to lecture and develop collaborations with faculty, bringing fresh perspectives to research programs and enhancing professional networking opportunities for the trainees. Conceptual breadth, technological depth and relevance of scholarship to brain health and disease are emphasized during coursework and research so that trainees emerge well-prepared to compete successfully in a rapidly advancing field.

While taking core and elective courses during their first year, students pursue three, required 8-week internships in the laboratories of faculty neuroscientists to introduce them to the questions, methods and opportunities associated with the research programs of potential doctoral mentors. Once a mentor match is made, students identify a research topic, assemble a faculty supervisory committee, and complete their remaining core and elective coursework

prior to defending a thesis proposal, written in the form of a federal research grant. Graduates of the program complete a minimum of 72 post-baccalaureate credit hours including 30 credit hours of specialized coursework and a minimum of 24 credit hours of dissertation research. The program organizes its curriculum and student recruitment to support three areas of research and education emphasis that together represent the breadth of modern brain sciences – 1) Cellular, Molecular and Biomedical Neuroscience, 2) Sensorimotor, Cognitive and Behavioral Neuroscience and 3) Theoretical and Computational Neuroscience.

IMPLEMENTATION PLAN/DATE

Effective Spring 2022, pending approval by the Florida Atlantic University Board of Trustees

FISCAL IMPLICATIONS

The faculty salary and benefits needed to support the program will derive entirely from reallocated base E&G funds across the five supporting colleges.

Supporting Documentation: New Degree Proposal Form
Presented by: Dr. Randy D. Blakely, Executive Director, FAU Brain Institute and Professor of Biomedical Science, Charles E. Schmidt College of Medicine
Phone: 561-799-8100

FLORIDA ATLANTIC UNIVERSITY

NEW/CHANGE PROGRAM REQUEST
Graduate Programs

UGPC Approval _____
UFS Approval _____
Banner _____
Catalog _____

Department Biological Sciences / Psychology

College Science

Program Name
PhD in Neuroscience

☑ **New Program***
☐ **Change Program***

Effective Date
(TERM & YEAR)
Spring 2022

Please explain the requested change(s) and offer rationale below or on an attachment.

The proposed PhD in Neuroscience is a collaborative, multi-college and multi-Institute sponsored effort to train the next generation of neuroscientists via an integrated, research-intensive experience that provides students with access to the concepts, methods, and questions that can set a foundation for career-long efforts to understand fundamental processes at work in guiding normal brain function and the pathological mechanisms that underlie devasting brain disorders. Through a transparent and representative governance structure that drives student recruitment into different Education and Research Emphasis Areas, and a flexible, curriculum that promotes a personalized approach to education, the NGP provides for the professional needs of faculty and students. The NGP organizes neuroscience researchers and educators from the FAU Colleges of Science, Medicine, Engineering and Computer Science, Education, the FAU Wilkes Honors College, Scripps Research Florida and Max Planck Florida to deliver a one-of-a-kind, technologically-sophisticated training opportunity for our students. Trainees are supported by a collaborative funding model involving the FAU Division of Academic Affairs, routed through Colleges and Departments, and the FAU Division of Research, routed through the FAU Brain Institute (I-BRAIN), and by the support derived from faculty grants, student fellowships and the resources of our partner Institutes.

*All new programs and changes to existing programs must be accompanied by a catalog entry showing the new or proposed changes.

Faculty Contact/Email/Phone
Randy Blakely / rblakely@health.fau.edu / 561 799-8100

Consult and list departments that may be affected by the change(s) and attach documentation
College of Medicine, Mechanical Eng. / College of Eng. and Computer Sci., Comm. Sciences and Disorders / College of Education, WHC, Center for Complex Systems & Brain Sci.

Approved by		***Date***
Department Chair	SL Mattox Robin Vallacher	2/4/2021 1/25/2021
College Curriculum Chair	Christopher Beetle Date: 2021.02.11 22:08:59 -05'00'	
College Dean	William David Kalie	02/12/21
UGPC Chair	Christopher Beetle	Mar 5, 2021
UGC Chair	Paul Pavlos	Mar 5, 2021
Graduate College Dean	Robert W Stackman	Mar 5, 2021
UFS President		
Provost		

Email this form and attachments to UGPC@fau.edu 10 days before the UGPC meeting.

Robin R. Vallacher
Department of Psychology
777 Glades Road
Boca Raton, FL 33431
tel: 561.297.3371
vallacher@fau.edu
http://psy2.fau.edu/~vallacher

MEMORANDUM

TO: William Kalies, Associate Dean for Graduate Studies, Charles E. Schmidt College of Science

FROM: Dr. Sarah Milton, Professor and Chair, Department of Biological Sciences SL Milton

Cc: Teresa Wilcox, Interim Dean, Charles E. Schmidt College of Science
Randy Blakely, Executive Director, FAU Brain Institute
Gary Perry, Director, Center for Complex Systems and Brain Sciences
Robin Vallacher, Interim Chair, Department of Psychology

DATE: February 8, 2021

RE: Neuroscience PhD proposal

The faculty of the Department of Biological Sciences have discussed the proposal to create a new PhD program in Neuroscience at Florida Atlantic University at length. We are satisfied the edits to the proposal have taken our concerns into account, and thus support its development. Our faculty look forward to contributing to the success of this new PhD program.

Robin R. Vallacher
Department of Psychology
777 Glades Road
Boca Raton, FL 33431
tel: 561.297.3371
vallacher@fau.edu
http://psy2.fau.edu/~vallacher

MEMORANDUM

TO: William Kalies, Associate Dean for Graduate Studies, Charles E. Schmidt College of Science

FROM: Robin R. Vallacher, Professor and Interim Chair, Department of Psychology

Cc: Teresa Wilcox, Interim Dean, Charles E. Schmidt College of Science
Randy Blakely, Executive Director, FAU Brain Institute
Gary Perry, Director, Center for Complex Systems and Brain Scienceas
Sarah Milton, Chair, Department of Biological Sciences

DATE: February 4, 2021

RE: Neuroscience PhD proposal

Dear Bill,

The faculty of the Department of Psychology has voted to support the proposal to create a new PhD program in Neuroscience at Florida Atlantic University. The faculty look forward to actively participating in the success of this new PhD program.

Sincerely,

Robin R. Vallacher, PhD
Professor and Interim Chair

Center for Complex Systems and Brain Sciences
& Department of Psychology
Charles E. Schmidt College of Science
777 Glades Road
Boca Raton, FL 33431-0991

Gary W. Perry, PhD
Behavioral Science (BS 12); Room 309
Email: perryg@fau.edu

MEMORANDUM

To: William Kalies, Associate Dean for Graduate Studies, Charles E. Schmidt College of Science

From: Gary W. Perry, Director, Center for Complex Systems and Brain Sciences

Cc: Teresa Wilcox, Interim Dean, Charles E. Schmidt College of Science
Randy Blakely, Executive Director, FAU Brain Institute
Robin Vallacher, Interim Chair, Department of Psychology
Sarah Milton, Chair, Department of Biological Sciences

Date: January 29th, 2021

Re: Neuroscience PhD proposal

Dear Bill,

Following extensive discussions over the past 18 months, the faculty of the Center for Complex Systems and Brain Sciences has voted to support the proposal to create a new PhD program in Neuroscience at Florida Atlantic University.

The faculty look forward to actively participating in the success of this new PhD program.

Sincerely,

Gary W. Perry, PhD
Professor of Neuroscience & Director

From: Marc Kantorow MKANTORO@health.fau.edu
Subject: Re: Neuroscience MOU
Date: January 7, 2021 at 11:02 AM
To: William Kalies WKALIES@fau.edu

Hi Bill,

Our Graduate Strategic Planning Committee has provided unanimous support for the Neuroscience PhD proposal and the Dean has approved the revised MOU.
Please find attached the approved MOU and let me know if you have any questions or need further help.
Hope all is good and may 2021 be better than 2020!
All the best,
Marc

Marc Kantorow PhD, FARVO
Associate Dean for Graduate Programs
Professor of Biomedical Science
Charles E. Schmidt College of Medicine
Florida Atlantic University
Boca Raton, FL USA 33431
mkantoro@health.fau.edu
561-297-2910

From: William Kalies <WKALIES@fau.edu>
Date: Wednesday, January 6, 2021 at 12:54 AM
To: Marc Kantorow <MKANTORO@health.fau.edu>
Subject: Neuroscience MOU

Hi Marc

Hope you had a good break. Attached is the revision of the MOU based on the discussions we had. Please let me know if this is acceptable. Randy is preparing a revision of the full proposal which we will send to you shortly. The plan is to submit for the Jan 27 UGPC meeting.

Bill

—
Bill Kalies
Associate Dean for Graduate Studies
Charles E. Schmidt College of Science
Professor of Mathematical Sciences

Florida Atlantic University
777 Glades Rd, SE-43, Room 242
Boca Raton, FL 33431
tel: 561-297-1107
—

From: **Stella Batalama** sbatalama@fau.edu
Subject: FW: Neuroscience PhD proposal
Date: February 2, 2021 at 10:00 AM
To: William Kalies WKALIES@fau.edu
Cc: Stella Batalama sbatalama@fau.edu, Mihaela Cardei mcardei@fau.edu

SB

Sent on behalf of Dean Stella Batalama:

Hi Bill,
The College of Engineering and Computer Science fully supports and will participate in the Neuroscience PhD degree program. The signed MOU is attached.

Thanks,
Stella

Stella Batalama, Dean
College of Engineering & Computer Science
Florida Atlantic University
http://www.eng.fau.edu

Marilyn Cordy-Burrell
Director, Executive and Administrative Affairs
Office of the Dean
College of Engineering & Computer Science
Florida Atlantic University
777 Glades Road, EE – 308
Boca Raton, Florida 33431

BE DARING
BE FAU.

From: William Kalies <WKALIES@fau.edu>
Sent: Thursday, January 14, 2021 3:20 PM
To: Mihaela Cardei <mcardei@fau.edu>
Cc: Randy Blakely <rblakely@health.fau.edu>; Teresa Wilcox <wilcoxt@fau.edu>
Subject: Neuroscience PhD proposal

Hello Mihaela

Here are the revised Neuroscience PhD proposal documents including a summary of the changes (I did not attach all of the appendices from the library and faculty CV's etc). I have also attached the MOU which CoM has already signed.

The timeline is that the revised proposal will be sent to the CoS Graduate Programs Committee on February 3 with departmental approvals. The CoS GPC would vote on Feb 9 and if approved send to the UGPC for their Feb 24 meeting and on from there.

Could you forward this to Dean Batalama and the relevant committees / faculty for consideration? We would need an email of support indicating the participation of engineering in the degree program and Dean Batalama's signature on the MOU.

Let me know if you foresee any issues.

Thanks,
Bill

—

Bill Kalies
Associate Dean for Graduate Studies
Charles E. Schmidt College of Science
Professor of Mathematical Sciences

Florida Atlantic University
777 Glades Rd, SE-43, Room 242
Boca Raton, FL 33431
tel: 561-297-1107

—

MOU between the Colleges of Science, Engineering and Computer Science, Medicine, and Education

Whereas the PhD in Neuroscience aims to be a collaborative, multi-college effort to train the next generation of neuroscientists via an integrated, interdisciplinary research-intensive experience, the following principles will apply to account for student enrollment in the Neuroscience PhD program:

1. Three Banner codes will be created for this degree: SC-PHD-NEURO, EG-PHD-NEURO, and ED-PHD-NEURO corresponding to the Colleges of Science, Engineering, and Education.
2. Newly admitted students will be assigned the SC-PHD-NEURO Banner code.
3. When a student is admitted to PhD candidacy with a fully approved Form 8, the Graduate College will change the student's Banner code to EG-PHD-NEURO or ED-PHD-NEURO, if necessary, based on the college of the PhD supervisor's primary appointment using a Form 16 signed by the student.
4. In the event that a student must change PhD advisors with a fully approved Form 9, the Graduate College will change the student's Banner code, if necessary, based on the college of the new PhD supervisor's primary appointment using a Form 16 signed by the student.
5. Students with Faculty PhD supervisors from the College of Medicine will remain in the College of Science. Under the College of Science Graduate Policies approved by the graduate faculty of the College of Science on October 5, 2010, such faculty will need to be appointed as affiliate faculty in a department in the College of Science.
6. IEA will attribute the enrollment and degrees granted in each code to the appropriate college based on the Banner code in all internal and external reporting for KPI metrics, dashboards, etc.
7. All academic forms and policies, such as Plan of Study, waiving a regulation (Form 10), academic misconduct, dismissal, etc., will be administered by the college corresponding to the student's Banner code. MyPOS record will be transferred by the Graduate College to the appropriate college as necessary.
8. Students will graduate from the college assigned in (3) with their diploma awarded by that college.

	Stella Batalama 1-27-21
Teresa Wilcox Date	Stella Batalama Date
Interim Dean of the College of Science	Dean of the College of Engineering

From: Dale Williams DWILLIAM@fau.edu
Subject: RE: PhD in Neuroscience
Date: November 25, 2020 at 12:26 PM
To: William Kalies WKALIES@fau.edu

Dr. Kalies:

I am happy to support the proposed Neuroscience Graduate Program (NGP) at FAU. As a speech-language pathologist who has researched and treated neurologically-impaired patients for over three decades, I appreciate the multidisciplinary approach and commitment to both basic and applied science. The program will provide students with a strong neurological basis and includes enough flexibility for them to focus on their areas of greatest interest while at the same time taking advantage of a multitude of perspectives from the distinguished faculty involved. For these reasons and more, I believe the NGP will attract top faculty and students to FAU, a benefit to the university and, ultimately, the neuroscience disciplines. I am grateful to be a part of this important endeavor.

Feel free to contact me if I can do any more to help. I look forward to hearing about the progress of the program.

Dale

****

Dale F. Williams, Ph.D., CCC-SLP, BCS-F
Board Certified Specialist in Fluency
Professor & Chair
Department of Communication Sciences & Disorders
Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431

office: 561-297-3238
department: 561-297-6074
clinic: 561-297-3285
fax: 561/297-2268
e-mail: dwilliam@fau.edu

http://www.coe.fau.edu/faculty/dwilliam/

****

-----Original Message-----
From: William Kalies <WKALIES@fau.edu>
Sent: Friday, November 20, 2020 10:34 AM
To: Dale Williams <DWILLIAM@fau.edu>

Cc: Paul Peluso <ppeluso@fau.edu>; Stephen Silverman <silverman@fau.edu>; Randy Blakely <rblakely@health.fau.edu>
Subject: PhD in Neuroscience

Hi Dale

I have attached the complete PhD in Neuroscience proposal. I believe Randy has talked to your faculty to describe the proposed program and the College of Education's participation in the program. There is an MOU between the colleges that I have also attached. Could we get a support email from you for this proposal? The plan is to put this through the next round of faculty governance. The materials are due to the GC by Monday November 30. If you need more time, we may be able to send the support email closer to the time of the UGPC meeting which is December 9.

Thanks,
Bill

—

Bill Kalies
Associate Dean for Graduate Studies
Charles E. Schmidt College of Science
Professor of Mathematical Sciences

Florida Atlantic University
777 Glades Rd, SE-43, Room 242
Boca Raton, FL 33431
tel: 561-297-1107

—

MOU between the Colleges of Science, Engineering and Computer Science, Medicine, and Education

Whereas the PhD in Neuroscience aims to be a collaborative, multi-college effort to train the next generation of neuroscientists via an integrated, interdisciplinary research-intensive experience, the following principles will apply to account for student enrollment in the Neuroscience PhD program:

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4. In the event that a student must change PhD advisors with a fully approved Form 9, the Graduate College will change the student's Banner code, if necessary, based on the college of the new PhD supervisor's primary appointment using a Form 16 signed by the student.
5. Students with Faculty PhD supervisors from the College of Medicine will remain in the College of Science. Under the College of Science Graduate Policies approved by the graduate faculty of the College of Science on October 5, 2010, such faculty will need to be appointed as affiliate faculty in a department in the College of Science.
6. IEA will attribute the enrollment and degrees granted in each code to the appropriate college based on the Banner code in all internal and external reporting for KPI metrics, dashboards, etc.
7. All academic forms and policies, such as Plan of Study, waiving a regulation (Form 10), academic misconduct, dismissal, etc., will be administered by the college corresponding to the student's Banner code. MyPOS record will be transferred by the Graduate College to the appropriate college as necessary.
8. Students will graduate from the college assigned in (3) with their diploma awarded by that college.

Teresa Wilcox 2-2-2021

Teresa Wilcox Date
Interim Dean of the College of Science

Stella Batalama 1-27-21

Stella Batalama Date
Dean of the College of Engineering and Computer Science

Philip M. Boiselle, MD 1/7/2021

Philip M. Boiselle Date
Dean of the College of Medicine

2/1/2021

Stephen Silverman Date
Dean of the College of Education

Robert W Stackman 2/2/2021

Robert Stackman Date
Dean of the Graduate College

Doctorate in Neuroscience

(Minimum of 72 credits required)

The Doctorate in Neuroscience is a multi-college, multi-institute interdisciplinary degree program organized in partnership with the FAU Brain Institute. Graduate level instruction is provided by faculty from the College of Science, the College of Medicine, the College of Engineering and Computer Science, and the College of Education. These faculty hold appointments in the Department of Biological Sciences, the Department of Biomedical Science, the Department of Psychology, the Department of Computer and Electrical Engineering and Computer Science, the Department of Ocean and Mechanical Engineering, and the Department of Communication Science and Disorders. Faculty from the Max Planck Florida Institute for Neuroscience and Scripps Research Florida also participate in the program as research mentors and co-mentors, respectively. The program aims to equip students with the advanced conceptual and technical skills needed to forge productive, neuroscience-oriented careers in industry, academia, and government. To allow for maximum flexibility in career aspirations, students have the opportunity to pursue thesis research in laboratories located in any of the Colleges and Institutes noted above. Program faculty have expertise in a broad range of research areas, including cellular and molecular neuroscience, cognitive and behavioral neuroscience, computational neuroscience, synaptic plasticity, brain development, learning and memory, neuroimmunology, auditory and speech neuroscience, visual neuroscience, and brain-related biomedical areas that seek to understand mechanisms and paths to the treatment of neurodegeneration, stroke, autism, epilepsy, depression, sleep disorders, and drug addiction, to name a few.

Admission Standards:

The program seeks to admit applicants who are academically excellent and have completed an undergraduate or M.S. degree demonstrating substantial training in the biological sciences, psychology, or engineering and computer sciences. Recommended preparation includes upper division courses in biology (molecular/cellular biology, genetics, physiology), psychology (animal and human behavior, learning and memory, cognition), chemistry (organic chemistry, biochemistry), mathematics (statistics and calculus), and computer engineering and programing. Prior coursework neuroscience is desirable, and evidence of prior research experience is particularly important. A competitive applicant usually will have prior research experience and should describe their research experience in the Statement of Purpose/Personal Statement.

Admission Requirements:

All students must meet the minimum graduate admission requirements of the University. Please refer to the Admissions section of this catalog. Additional requirements are:

- Completion of a Bachelor's or M.S. degree from a regionally accredited institution in an appropriate major, prior to anticipated start date in the PhD Program.
- Minimum grade point average of 3.40 as an undergraduate and/or M.S. student.
- Complete sets of transcripts from previous institutions(s) attended.
- A minimum of 3 letters of recommendation, preferably from instructors and advisors who are familiar with the applicant's recent academic or research experience.
- An essay of Purpose/Interests in the form of a Personal Statement
- Graduate Record Examination scores are optional
- International students whose native language is not English must score at least 79-80 (Internet-based test) on the Test of English as a Foreign Language (TOEFL). Satisfactory

TOEFL scores can offset verbal GRE scores at the discretion of the program's admission committee. Additionally, international students whose transcripts are from non-U.S. institutions must have their credentials evaluated course-by-course. International students must also demonstrate competency in spoken English.

Previous Graduate coursework may be applied toward the course requirements of the Neuroscience Ph.D. Students may receive up to 15 credits earned beyond the baccalaureate degree, including up to 9 credits of Core course credit, not to include Laboratory Rotations and Neuroscience Seminar, based on comparable courses taken prior to admission. Transfer credits must be approved by the Program Curriculum Committee and the Graduate College. Evaluation of transfer credits will be based on content and will require an official copy of each course syllabus for assessment.

Degree Requirements:

The Doctor of Philosophy in Neuroscience is a research-intensive degree requiring a minimum of 72 credits beyond the baccalaureate degree.

The following are specific requirements for the Neuroscience Ph.D. degree:

1. Completion of 21 Core credits listed in the table below.
2. Completion of 9 Elective credits from the courses listed in the table below.
3. Completion of 24 dissertation credits.
4. The remaining 18 credits may include elective coursework at the 6000-level or above, Advanced Research, or Dissertation Research credits that support the student's research plan with approval of the student's Ph.D. supervisor.
5. The 4 Research Rotations (1 credit each in the core) represent 8-week research internships in at least 3 different laboratories in the Fall and Spring semesters of Year 1. The 4th rotation may be a second rotation back in a lab where the student previously rotated, and where by mutual agreement the student is likely to pursue their Ph.D. studies, or a 4th Research Rotation if the student has not matched with a mentor.
6. Acceptance into the laboratory of an approved program faculty member for thesis research by the end of the Spring Semester of Year 1.
7. Achievement of a "B" or higher grade in all courses, with an overall GPA of at or above 3.0 maintained.
8. With the exception of Neuroscience Seminar and Laboratory Rotations, no Core or Elective courses can be taken as Satisfactory/Unsatisfactory.
9. Students must enroll in the Neuroscience Seminar each Fall and Spring semester for the entire time they remain in program, with the expectation that most students will graduate in 5 years. Starting in Year 2, the Neuroscience Seminar will be taken for 0 credit.
10. Admission to PhD candidacy requires the writing and successful public defense of an original dissertation research proposal.
11. Degree completion requires the writing and successful public defense of a dissertation describing the context, approach, results and impact of thesis research.
12. Students are expected to publish at least one peer-reviewed research paper as first author involving research activities described in their thesis proposal prior to degree completion.

Table of Required Core Courses:

Cellular and Molecular Neuroscience	PSB 6345	3
Systems and Integrative Neuroscience	PSB 6346	3

Experimental Design 1 or Computational Neuroscience	PSY 6206 or ISC 6460	3
Scientific Communication	BSC 6846	3
Neuroscience Laboratory Rotations (2 in Fall, 2 in Spring)	PSB 6977[t]	4
Neuroscience Seminar (1 in Fall, 1 in Spring, 0 thereafter)	BSC 6938	2
Brain Diseases: Mechanisms and Therapy	BMS 6736	3
Required Core credits:	**21**	
Required Dissertation credits:	PSB 7980[t]	**24**

Free Electives	
CHOOSE AT LEAST 3 COURSES FROM THE TABLE OF ELECTIVE COURSES	
Free Elective Credits:	9

Table of Elective Courses:

Experimental Design 2	PSY 6297	3
Biostatistics	STA 5195	3
Human Neuroanatomy	BSC 6748	3
Functional Neuroanatomy*	PSB 6930	3
Neurophysiology	PCB 6835C	3
Practical Cell Neuroscience	BSC 6417C	3
Advanced Neurophysiology Lab	PCB 6937L	3
Neuroimmunology*	PCB 6933	3
Advanced Molecular and Cellular Biology	PCB 5532	3
Advanced Cell Physiology	PCB 6207	3
Developmental Neurobiology	PSB 6515	3
Neurobiology of Addiction	PCB 5844	3
Neuroscience of Sleep*	PSY 6930	3
Neuroplasticity*	PCB 6933	3
Adult Neurogenesis	PCB 6848	3
Pharmacology*	PCB 6933	3
Cognitive Neuroscience	ISC 5465	3
Principles of Neurobiological Signal Processing	ISC 6466	3
Biosignal Processing	COT 5930	3
Seminar in Cognition	EXP 6609	3
Attention and Consciousness*	EXP 6930*	3
Seminar in Behavioral Neuroscience	PSB 6058	3
Seminar in Sensory Processes	PSB 6609	3
Foundations of Vision	CAP 6411	3
Seminar in Human Perception	EXP 6208	3
Developmental Neuropsychology	PSB 6516	3
Methods in Complex Systems	ISC 6450	3

Nonlinear Dynamical Systems	ISC 5453	3
Introduction to Neural Networks	CAP 5615	3
Computational Neuroscience 1	ISC 6460	3
Brain Modeling	EEL 6035	3
Artificial Intelligence	CAP 6635	3
Machine Perception and Cognitive Robotics	EXP 6930	3
Introduction to Data Science	CAP 5768	3
Data Mining and Machine Learning	CAP 6673	3
Data Mining for Bioinformatics	CAP 6546	3
Biomedical Data and Informatics	BSC 6459	3
Bioinformatics: Bioengineering Perspectives	BME 6762	3
Neural Basis of Human Communication	SPA 5107	3
Adult Language Disorders	SPA 6410	3
Genetics of Communication Disorders	SPA 6438	3
Advanced Research (spring year 1)	PSB 7978[t]	1-6

* Special topics courses.

[t]Three course codes created for this degree that will be used only following university review and approval. All courses not yet approved by the Florida Statewide Course Numbering System that will be used to satisfy degree requirements will be evaluated individually on the basis of content and will require a Catalog Course description and a copy of the syllabus for assessment.

Supervisory Committee Requirements:

By mutual agreement, students identify their final Ph.D. supervisor and research lab before the end of the spring semester of Year 1. A Supervisory Committee, including the PhD supervisor and 3 other graduate faculty, knowledgeable in aspects of the project, is assembled during the fall of year 2. Students are encouraged to include on their Committee one faculty-level member who is not a member of the NGP Program, including graduate faculty from other institutions. The Ph.D. supervisor serves as the Chair of the Supervisory/Dissertation Advisory Committee, except when the supervisor is an affiliate FAU faculty member at the Max Plank Florida Institute or the Scripps Research Institute Florida. The Chair of the Committee must have a full-time appointment at FAU, with affiliate faculty serving as Co-Chairs.

Qualifying Exam and Proposal Defense:

NGP students must prepare a written grant proposal modeled on NIH or NSF templates for predoctoral fellowship applications. The proposal will be targeted to their chosen area of research. Students will present their proposal orally in an open forum advertised to the university community, followed by an oral examination consisting of questions from the student's Supervisory Committee. Following the defense, committee members vote to either Pass, Pass with Conditions, or Fail the student. If Passed with Conditions, students must be able to satisfy any conditions set by the Committee within 3 months prior to resubmission of their proposal for a second oral examination.

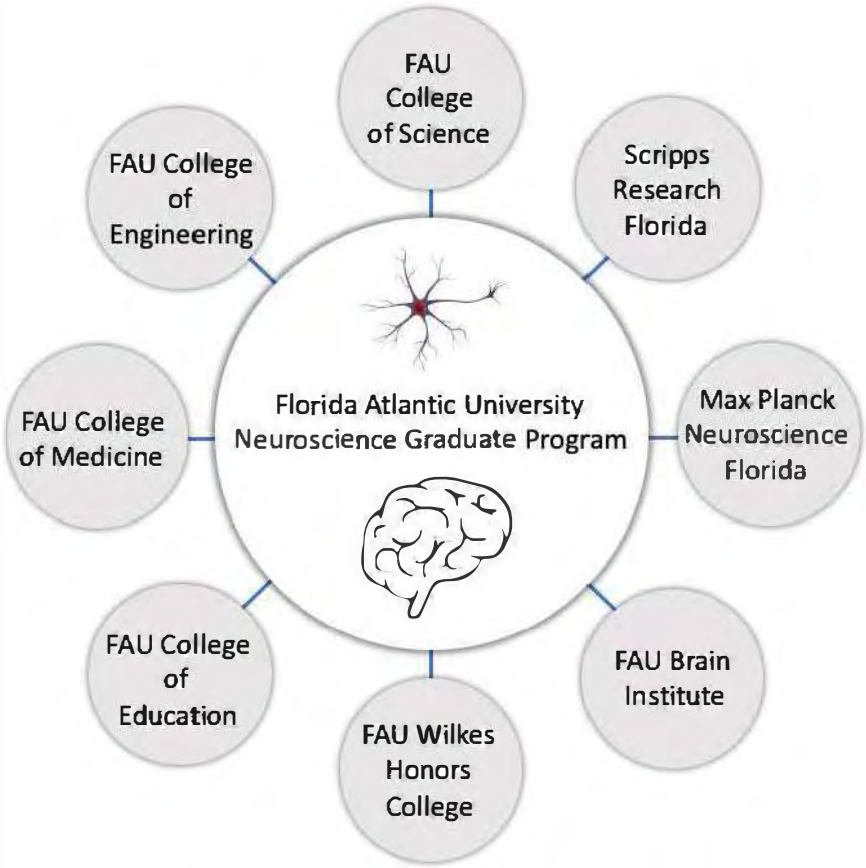
Doctoral Dissertation Defense:

NGP students will develop a written dissertation following the format required by the Graduate College, present the findings of their research orally in a forum open and advertised to the public, followed by an oral examination by the student's Dissertation Committee. Following the defense, committee members vote to either Pass, Pass with Conditions, or Fail the student. Students must satisfy any conditions imposed by the committee within 3 months, prior to resubmission of their proposal for a second oral examination. The Committee shall determine whether the student Passes or Fails the thesis defense examination and allow for a re-examination following the rules of the Graduate College.

Appendix F: FAU Neuroscience Graduate Program Structure and Governance

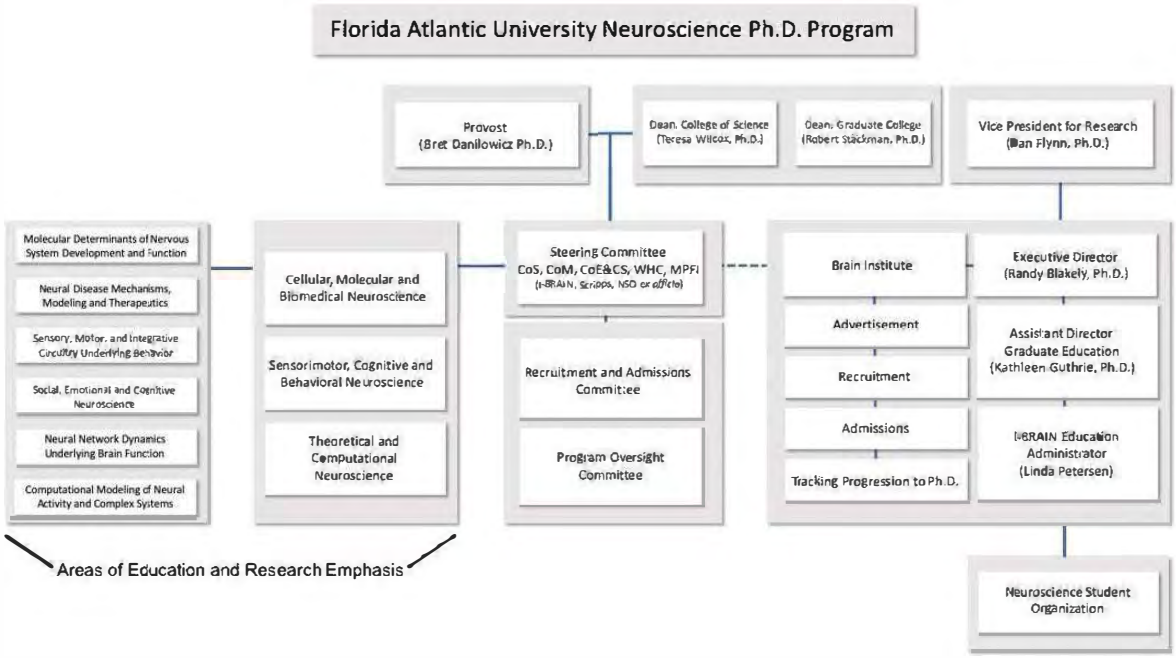
I. FAU Neuroscience Graduate Program (NGP) Participating Units

The FAU GNTP is a collaborative, multi-college and multi-Institute sponsored effort to train the next generation of neuroscientists via an integrated, research-intensive experience that provides students with access to the concepts, methods, and questions that can set a foundation for career-long efforts to understand fundamental processes at work in guiding normal brain function and the pathological mechanisms that underlie devasting brain disorders. Through a transparent and representative governance structure that drives student recruitment into different Education and Research Emphasis Areas, and a flexible, curriculum that promotes a personalized approach to education, the NGP provides for the professional needs of faculty and students. The NGP organizes neuroscience researchers and educators from the FAU Colleges of Science, Medicine, Engineering and Computer Science, Education, the FAU Wilkes Honors College, Scripps Research Florida and Max Planck Florida to deliver a one-of-a-kind, technologically-sophisticated training opportunity for our students. Trainees are supported by a collaborative funding model involving the FAU Division of Academic Affairs, routed through Colleges and Departments, and the FAU Division of Research, routed through the FAU Brain Institute (I-BRAIN), and by the support derived from faculty grants, student fellowships and the resources of our partner Institutes.



II. Overview of NGP Organization and Administrative Structure

The activities of the FAU NGP are supported through the collaborative participation of the Division of Academic Affairs and the Division of Research as shown in Figure 1. The Division of Research, through its support for the Brain Institute (I-BRAIN), supports the administration of the program and provides support for trainee stipends as well as for the research infrastructure needed for students to pursue research. The Division of Academic Affairs, through its support for Colleges and Departments provides support for trainee stipends and the educational infrastructure characteristic of a modern university. The Graduate College, which ultimately awards the Neuroscience PhD, provides support for program tuition and for professional development activities that help students to develop communication skills, to pursue professional networking opportunities, and to identify career options. The Neuroscience Student Organization (NSO) enhances the educational experience by increasing student awareness of research and professional opportunities via peer-driven networking events, informal science gatherings, hosting of speakers, program leadership, and community engagement activities.



The Division of Research (currently headed by Vice President for Research Daniel Flynn, PhD), provides all support for I-BRAIN to administer the NGP. The I-BRAIN Executive Director (currently Randy Blakely, Ph.D.) serves as Director of the NGP. The NGP Director coordinates the funding of the NGP and works with the Vice President of Research and the Deans of the Colleges, (who then report to the Provost (currently Bret Danilowicz, PhD)), to determine each year the number of trainees that can be recruited and supported in the subsequent year. The NGP Director is also the Director of NGP-specific Training Grants and oversees NGP marketing and other modes of program visibility. The NGP Director works closely with the Chair of the Steering Committee and its members to receive annual faculty input regarding I-BRAIN's management of the program,

and the distribution of students among the major Areas of Education and Research Emphasis. The Director does not select program faculty, nor select students for interviews or acceptance.

The Director's administration of the NGP is supported by the I-BRAIN Assistant Director for Graduate Education (currently Kathleen Guthrie, Ph.D.) who is appointed by the I-BRAIN Executive Director and who receives effort support from I-BRAIN. The Assistant Director for Graduate Education assists with student recruitment and serves as coordinator and student advisor during the 1st year of the program, when students are engaged in laboratory rotations. The Assistant Director also assists with orientation of new students, documents student completion of required compliance training, and verifies completion of an initial Plan of Study which is provided to the Curriculum Committee for approval, followed by submission to the Graduate College. The Assistant Director also oversees the Fall and Spring Semester Neuroscience Seminar Series, and coordinates guest speaker invitations with program faculty in order to achieve a balanced representation of speakers across the three major Areas of Education and the multiple FAU campuses. The Assistant Director also serves as an Advisor to the Neuroscience Student Organization (NSO), a Graduate Student Association-approved organization that is student governed supports the professional development of trainees pursuing education and research in multiple FAU graduate programs. The Assistant Director and the three NGP Committees are assisted by a dedicated Education Administrator (currently Ms. Linda Petersen) who is supported by I-BRAIN and appointed by the I-BRAIN Executive Director. The Administrator oversees the overall administrative operations of the NGP, including NGP advertising, the hosting of applicants for interviews and other recruitment events, ensures timely submission of application materials and faculty reviews to the Recruitment Committee, coordinates new student orientation, schedules NGP Committee meetings, and takes/distributes minutes for NGP Committee meetings. The Administrator works with the I-BRAIN Assistant Director of Administrative Operations (currently Gala Pierce) to coordinate student stipend payments and benefits. The Assistant collects information related to the academic progression of students and communicates these to NGP Committees as requested.

III. NGP Committee Responsibilities and Member Selection

Steering Committee: NGP oversight is the responsibility of the NGP Steering Committee. The Steering Committee is responsible for the program By-Laws and its potential modifications which can be suggested at any time by NGP training faculty and then reviewed at regularly scheduled Committee meetings. If voted meritorious by the Steering Committee, By-Law modifications can be made, provided majority support by the NGP training faculty. The Steering Committee receives and votes on the addition or dismissal of faculty as NGP training mentors and reviews any issues related to program operations or to faculty/student interactions, forwarding relevant information and opinions to the Dean of the College of Science, who serves as the reporting officer within Academic Affairs. Any faculty or student issues that are reported to the Dean of the College of Science are communicated in parallel to the Dean and Department Chair of the faculty involved and the Dean of the Graduate College. The Steering Committee meets annually with the Program Director to review the distribution of recruitment slots to the three Areas of Education and Research Emphasis. This distribution will be determined annually by the NGP Director based on the prior distribution of students admitted the previous year, the funding needs of the existing students, and the availability of positions funded by the Colleges and the Division of Research.

The Steering Committee will be made up of 11 members, appointed by the Deans of the represented Colleges, with the input of NGP faculty from the College. Proportional representation of faculty in relation to College participation is a guiding goal in forming the committee. Colleges contributing at least 4 faculty to the program will be represented by at least 1 voting member on

the committee. Based on the projected College representation of faculty, 6 faculty from the College of Science, 3 faculty from the College of Medicine, 1 faculty from the Wilkes Honors College, and 1 faculty from the College of Engineering and Computer Science will comprise the voting members of the committee. The NGP Director and a faculty member from both Max Planck Florida and Scripps Florida will be invited to join Steering Committee meetings in a non-voting capacity, as will the President of the Graduate Neuroscience Student Organization (NSO). Chairs of the Curriculum and Recruitment Committees will also be invited to attend committee meetings in a non-voting capacity. Total number of faculty needed to achieve proportionality, while maintaining an odd number for voting, may lead to a change in the number of faculty on the committee. Committee number and representation will be reviewed annually by the Chair of the Committee, in consultation with the NGP Director and Dean of the College of Science. College representatives on the Steering Committee will be selected by the Dean of each College or their designee based on a vote of the training faculty, with adjustments allowed based on conflicting assignments or a need to achieve balance across areas of representation. Committee members serve renewable 3 Yr terms. The Chair of the Committee is selected by a vote of the Committee prior to the first committee meeting, serving a 3 Yr term.

The Steering Committee, in consultation with the Dean of the College of Science and the NGP Director, drafts the initial NGP By-Laws document that serves as guiding rules for the operation of the program. Creation and amendment of By-Laws for this program shall be approved by a vote of the NGP training faculty. Annually, the NGP Director and the Chair of the Steering Committee hold a Program Faculty Assembly to review any proposed changes to By-Laws and to discuss recruitment results in the past year, program metrics, program finances and program recruitment or any other issues of relevance to the NGP in the coming year. These bylaws shall be reviewed periodically, generally every three years, and readopted by the NGP training faculty.

To further ensure that maximum opportunities are taken to ensure the application, recruitment and success of trainees from underrepresented groups, a subcommittee of the Steering Committee will be formed that is focused on Diversity Opportunities. The members of the subcommittee will report on ongoing and potential changes to NGP practices to optimize program diversity. Actions recommended by the subcommittee will be voted on by the full committee for implementation.

Recruitment Committee: The NGP Recruitment Committee ranks applicants for interviews and admission with the number of slots determined annually based on available institutional resources and faculty support for trainee stipends. Rankings for offers of admission to the NGP in the subsequent Fall semester are determined by representatives of each Area of Emphasis based on feedback from faculty after interviews are completed. The NGP Director works with the Steering Committee to establish the distribution of students to be ultimately accepted among the different Areas of Emphasis based on total number of positions that can be funded, the representation of Areas of Emphasis by program faculty, and prior patterns of trainee recruitment in these Areas. Faculty are provided with the files of all applicants who meet minimum program requirements, as established each year by the Steering Committee and according to Graduate College requirements. The Recruitment Committee works with staff of the Brain Institute to coordinate interviews, reviews faculty feedback after interviews, and ranks students for offers of admission. Regardless of participation in interviews, all faculty associated with the NGP will be able to view applications and provide input as desired. Members of the Recruitment Committee are appointed by the Steering Committee based on a vote of faculty in the specific Area of Emphasis for 3 Yr terms and is composed of 3 faculty from each Area of Emphasis. A Chair of the Recruitment Committee rotates between representatives of the different Emphasis Area. The Chair of the

Recruitment Committee is invited to attend Steering Committee meetings as a non-voting member and reports to the Committee on the Recruitment Committees plans and activities at least once annually.

The Chair of the Recruitment Committee will work with the Directors of the Experimental Psychology and Integrative Biology Graduate Program, as well as the FAU-Max Planck Florida IMPRS Program to share information concerning applicants so as to consider whether students might be more appropriate for one of the other programs or should be interviewed by the different programs in parallel or collaboratively. Advanced students already in the NGP can apply to join the FAU-Max Planck Florida IMPRS Program, but will continue with the NGP as the home for their degrees. Similarly, students applying to the IMPRS program from other FAU graduate programs will remain a student of the same program for the completion of their Ph.D. Students who are accepted to the FAU-Max Planck Florida IMPRS Program from other institutions can apply to join the NGP and receive academic credit for courses taken elsewhere, with approval from the Curriculum Committee and up to limits established for other students in the NGP. Students who enter the NGP from the FAU- Max Planck Florida IMPRS Program can be approved to enter directly into a faculty member's laboratory if suitably advanced and fully supported by IMPRS mentor funds. These students will complete an NGP Plan of Study, complete Core and Elective Coursework, and complete all requirements for graduation prior to awarding of the Ph.D.

Several mechanisms are designed into the NGP to promote a fair distribution of students across the breadth of faculty programs. First, faculty we allowed a maximum of two students supported by program resources at any one time. A third student may rotate in a lab where 2 students are still pursuing dissertation work so long as one of the existing student's plans to defend their thesis in the next 6 months. Second, in order to spread invitations for interviews and offers of admission as broadly as possible, training faculty will self-define their primary Area of Emphasis so that the results of past recruitments in terms of Areas served can be considered by the NGP Director and Steering Committee in developing the next year's recruiting plan. The Emphasis Area that best defines a faculty member's research program will no doubt change for some faculty or the faculty member may wish to shift priority area. Prior to recruitment of each class, faculty will be asked to define the Emphasis Area that best defines their existing students. With this information, the NGP Director, in consultation with the Steering Committee will develop the recruitment distribution to be used by the Recruitment Committee. The NGP Director will communicate the planned distribution to the training faculty in advance and solicit feedback prior to initiation of recruitment. Regardless of Area representation, all training faculty will be expected to participate in recruitment visits and student interviews when asked, as their schedules permit.

Curriculum Committee: The NGP Curriculum Committee reviews and approves/declines course additions to the curriculum, approves Thesis committee members selected by the student and mentor, approves Plans of Study and any needed changes therein including the substitution of Course credits for Research credits, as well as the awarding of program credit given for graduate-level coursework taken before entering the program. The Curriculum Committee is comprised of 3 NGP-affiliated faculty, one from each Area of Emphasis, and are appointed by the Steering Committee based on faculty vote for 3 Yr terms. A Chair of the Committee rotates annually between representatives of the different Emphasis Areas. The Chair of the Committee is invited to attend Steering Committee meetings as a non-voting member and reports to the Steering Committee at least once annually on any curriculum changes and student performance issues and is assisted in Committee activities by the I-BRAIN Education Assistant. The Committee reviews Plans of Study and all forms related to admission to candidacy, change forms, request for exceptions, dismissal or other student misconduct accusations. The Committee forwards properly completed forms related to plans of study and advancement to candidacy directly to the

Graduate College. After admission to candidacy, these forms will be forwarded to the Dean of the College in which the mentor holds their primary appointment. Any issues related to faculty or student misconduct will be brought to the attention of the Steering Committee and communicated to the College of Science Dean and the College where the faculty holds their primary appointment for evaluation.

IV. Proposed Curriculum:

Fall Year 1
1. Cell and Molecular Neuroscience – 3 Credits (Core)
2. Experimental Design I or Computational Neuroscience I – 3 Credits (Core)
3. Neuroscience Laboratory Rotations (1st and 2nd Rotation) – 2 Credits (Core)
4. Neuroscience Seminar – 1 Credit

Spring Year 1
1. Systems and Integrative Neuroscience – 3 Credits (Core)
2. Elective 1 – 3 Credits
3. Neuroscience Laboratory Rotations (3rd Rotation) – 2 Credits (Core)
4. Neuroscience Seminar – 1 Credit

Summer Year 1
1. Advanced Research – 1 Credit

Fall Year 2
1. Brain Disorders and Therapeutics– 3 Credits (Core)
2. Elective - 3 Credits
3. Advanced Research – 3 Credits
4. Neuroscience Seminar – 0 Credits

Spring Year 2
1. Elective 3 – 3 Credits
2. Scientific Communications– 3 Credits (Core)
3. Advanced Research – 3 Credits
4. Neuroscience Seminar – 0 Credits

Summer Year 2 (Write Thesis proposal)
1. Advanced Research – 1 Credit

Year 3 Fall (Defend Proposal)
1. Advanced Research – 9 Credits
2. Neuroscience Seminar – 0 Credits

Years 3-5 Fall, Spring and Summer
1. Dissertation Research – 1-9 Credits each semester
2. Neuroscience Seminar – 0 Credits

V. Training Faculty Representation in Areas of Education and Research Emphasis

Several mechanisms are designed into the NGP to promote a fair distribution of students across the breadth of faculty programs. First, faculty we allowed a maximum of two students supported

by program resources at any one time. A third student may rotate in a lab where 2 students are still pursuing thesis efforts so long as one of the existing student's plans to defend their thesis in the next 6 months. Second, in order to spread invitations for interview and offers of admission as broadly as possible, training faculty will self-define their primary Emphasis Areas so that the results of past recruitments in terms of Areas served can be considered by the NGP Director and Steering Committee in developing the next year's recruiting plan. The Emphasis Area that best defines a faculty member's research program will no doubt change for some faculty or the faculty member may wish to shift priority area if they have already successfully recruited to another Emphasis Area and wish not to attract a student with distinct interests and aptitudes. Prior to recruitment of our class, faculty will be asked to define the Emphasis Area that best defines their existing students. With this information, the NGP Director, in consultation with the Steering Committee will establish the recruitment distribution used by the Recruitment Committee. The NGP Director will communicate the planned distribution to the training faculty in advance and solicit feedback prior to initiation of recruitment. Regardless of Emphasis Area representation, all training faculty will be expected to participate in recruitment visits when asked and their schedules permit. The Emphasis Areas designated with the initiation of the program may be redefined over time by the Steering Committee and with faculty input to capture changes in field delineation, though Areas should remain representative of the full breadth of the discipline as best possible. Below, we provide a projected distribution of tenure-track and tenured faculty among Emphasis Areas.

Cellular, Molecular and Biomedical Neuroscience	Sensorimotor, Cognitive and Behavioral Neuroscience	Theoretical and Computational Neuroscience
Randy Blakely	Rindy Anderson	William Alexander
McLean Bolton	Gizelle Anzures	Raquel Assis
Lucia Carvelli	Salil Bidaye	Elan Barenholz
Predrag Cudic	Jason Christie	Stephen Bressler
Ken Dawson-Scully	Ali Danesh	Lun-Ching Chang
Gregg Fields	Chad Forbes	Erik Engeberg
Deguo Du	David Fitzpatrick	Behnaz Ghorani
Erik Duboue	Sang Hong	William Hahn
Tanja Godenschwege	Nancy Jones	Hidehiko Inagaki
Patrick Grant	Alan Kersten	Scott Kelso
Kathleen Guthrie	Johanna Kwalko	Zongwei Li
Ceylan Isgor	Connie Porcaro	Ramin Pashaie
Kailiang Jia	Shaefali Rogers	Mahsa Ranji
Marc Kantorow	Monica Roselli	Emmanuelle Tognoli
Alex Keene	Wen Shen	
Andy Khamoui	Summer Sheremata	
Greg Macleod	Robert Stackman	
Sarah Milton	Sarah Stern	
Rod Murphey	Hiroki Tanaguchi	
Howard Prentice	Teresa Wilcox	
Ning Quan	Henriette van Praag	
Vidya Ranaraju	Carmen Varela	
Janet Robishaw	Robert Vertes	
Rui Tao	Yingxue Wang	
Larry Toll		

Jenny Wei		
John Wu		
Ryohei Yasuda		

VI. Student Support:

Funds from Division of Academic Affairs: Each year, based on existing financial circumstances and the need to support of the full spectrum of university education, the Division of Academic Affairs, via its Colleges and Departments, provides funds to support Graduate Teaching Assistantships (GTAs) to help–cover the stipends of NGP trainees. The commitment to the program provides for funds that can cover 4 GTAs in Yr 1, monies that are allotted to the College of Science. The Dean of the College of Science assigns the teaching commitments of the students who hold these GTAs to College of Science Departments who then match the student to specific teaching assignments in keeping with the needs of their undergraduate educational programs. Growth in GTA numbers are currently projected for the first 5 years of the program reaching 20 GTAs total by 5 Yrs. These GTAs may be augmented or substituted by GTAs provided by other Colleges at their discretion. The students who hold the latter types of GTAs, if contributed, will be assigned by the Dean of the College to the Departments that will match the student to specific teaching assignments in keeping with the needs of their undergraduate educational programs.

Funds from Division of Research: Each year, based on existing financial circumstances and the need to invest in infrastructure supporting university research, the Division of Research, via I-BRAIN, provides funds for Graduate Teaching Assistantships (GTAs) to help support the stipends of NGP trainees. The initial commitment to the program provides funds that can cover 4 GTAs in Yr 1, monies that are provided via I-BRAIN to the College where the student's mentor holds their primary academic appointment. The Dean of the respective College assigns the teaching commitments of the students who hold these GTAs to College Departments who then match the student to specific teaching assignments in keeping with the needs of their undergraduate educational programs. Growth in Division of Research-funded GTAs is currently projected for the first 5 Yrs of the program so that 20 GTAs will be funded by Yr 5 of the program, with funds for any additional GTAs identified through the activities of I-BRAIN in securing discretionary funds based on IDC recovery from I-BRAIN faculty recruitments, training grants, or gifts targeted to I-BRAIN-sponsored educational programs. The students who hold the latter GTAs, if contributed, will be assigned to the College where the student's mentor holds their primary academic appointment. The Dean of that College assigns the teaching commitments of the students who hold these GTAs to College Departments who then match the student to specific teaching assignments in keeping with the needs of their undergraduate educational programs. For the students holding GTAs sponsored either by I-BRAIN or the College of Science, I-BRAIN will provide a top-up of stipend to achieve a nationally-competitive stipend (top up currently set to achieve a total salary of $30,000) as well as cover health insurance costs that are unmet by the Graduate College (up to $3,000). Support for stipends, top-ups and insurance, unless these can be covered by investigator grants, student fellowships, MPFI fund or other funding, are guaranteed by I-BRAIN for 5 years.

GTAs that are liberated by faculty or trainee grants or other sources (e.g. philanthropy) will return to the program to allow for growth. The use of these GTAs will remain associated with either the College of Science or Division of Research via I-BRAIN depending on the source of original provision.

Funds from Graduate College: The Graduate College provides support for tuition waivers for NGP trainees throughout the course of their education, unless substituted by other sources, such as faculty grants or student fellowships.

Additional Support: For students whose stipend is supported by faculty grants, I-BRAIN will continue to provide a top-up, if needed, above the amount the grant can support to maintain the trainee's salary at the level provided upon entry to the program. Both stipend and top-up costs are provided from MPFI-based funds if a student pursues their PhD thesis under an MPFI mentor.

Support to Grow Program Trainee Numbers: Currently, our budget model provides for funds derived from the Division of Academic Affairs and the Division of Research to cover 8 trainees recruited in Yrs 1 and 2 of the NGP. Based on a conservative estimate of the ability of faculty to support trainee salaries, of students to secure external fellowships that cover most or all of the cost of their education, and of the program to obtain Training Grant funds, we project that we can grow the NGP to admit 10 students in Yrs 3 and 4, and to 12 students in Yr 5. These numbers may increase or decrease depending on the financial circumstances of both Divisions. It is expected that the monies obtained will convert GTAs into Graduate Research Assistantships (GRAs) that allow students to pursue research.