UNC COLLEGE OF ARTS & SCIENCES

THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

DEPARTMENT OF PSYCHOLOGY AND NEUROSCIENCE

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DONALD T. LYSLE, Ph.D.
KENAN PROFESSOR AND CHAIR

October 23, 2017

Abigail Panter, Ph.D.
Office of Undergraduate Curricula
University of North Carolina Chapel Hill
Campus Box 3504

Dear Dean Panter,

We are pleased to submit this Request to Establish for an interdisciplinary Neuroscience major here at the University of North Carolina at Chapel Hill. Neuroscience is the academic field that seeks to understand how neural systems give rise to thought and behavior.

Neuroscience embodies the liberal arts experience as it draws on techniques and findings from several academic disciplines including biology, chemistry, computer science, mathematics, physics, and psychology. The development of a Neuroscience major at UNC Chapel Hill will give our highly qualified and motivated undergraduates the opportunity to study neuroscience, providing them with the fundamental knowledge and exposure needed to pursue careers and post-graduate studies in fields related to psychology, human development and aging, health and disease, rehabilitation, biomedical research, human-machine interactions, and other emerging disciplines.

The field of neuroscience has become of increasing interest to our undergraduate students, and current demand for a Neuroscience major is very high. In March 2009, the undergraduate Carolina Neuroscience Club (CNC) was formed with more than 100 student members. Today, the club includes more than 500 students, representing all undergraduate years and a wide variety of declared majors, including Psychology, Biology, Chemistry, Philosophy, Computer Science, Exercise and Sports Science, Economics, English, Environmental Health, Physics, Linguistics, Mathematics, Political Science/International Studies, and Business. Since the inception of the CNC, the students have met each week, focusing on professional development, undergraduate opportunities (including research, summer programs, and conferences), social events, and service (e.g., Brain Awareness Week). To preview their past, current, and planned events, please visit the CNC website at http://carolinaneuroscience.web.unc.edu/.

Spurred by the sheer number of students, as well as the consistency and intensity of their interest in the field, we pursued the approval of a Neuroscience minor. The neuroscience minor, launched Fall 2015 with 535 students currently enrolled, consists of one required course (i.e., Introduction to Neuroscience), as well as 4 elective courses drawn from at least two academic departments. A major in neuroscience would provide students with more formal study of the field, broadening their awareness of, and exposure to the behavioral effects, cellular and molecular processes, and computational mechanisms of the brain. Currently, several peer or local institutions offer an

undergraduate neuroscience major, including Duke University, East Carolina University, Ohio State University, University of California at Los Angeles, University of Maryland, University of Michigan, University of Pittsburgh, University of Virginia, and Washington University in St. Louis. The establishment of a Neuroscience major will meet the undergraduate demand for neuroscience on our campus, and substantively strengthen the UNC system in undergraduate neuroscience education.

Finally, in addition to the advising core in Steele Building, students in the Neuroscience major will be advised by Dr. Kelly Giovanello, Professor in the Department of Psychology and Neuroscience and Director of Undergraduate Neuroscience Curriculum, who has led the initiative to develop the Neuroscience proposal and serves as the faculty mentor to the Carolina Neuroscience Club. She will assist students with information for planning and completing the major. Dr. Desiree Griffin, the Psychology and Neuroscience Director of Advising, and other faculty who traditionally serve as advisors will also be available to talk with students about the Neuroscience major. We anticipate that peer advising might also occur through the Carolina Neuroscience Club.

Thank you for considering this proposal. If you have any questions, please feel free to contact us.

Sincerely,

Donald T. Lysle, Ph.D.
Kenan Distinguished Professor
Chair, Department of Psychology and Neuroscience

Regina M. Carelli, PhD
Stephen B. Baxter Distinguished Professor
Associate Chair, Department of Psychology and Neuroscience

Kelly S. Giovanello, Ph.D.
Professor and Director of Undergraduate Neuroscience Curriculum
Department of Psychology and Neuroscience

UNIVERSITY OF NORTH CAROLINA
REQUEST TO ESTABLISH
A NEW DEGREE PROGRAM – ANY DELIVERY METHOD

Date: October 1, 2017

Constituent Institution: The University of North Carolina at Chapel Hill

Is the proposed program a joint degree program? Yes____ No__X_

Joint Partner campus _____

Title of Authorized Program: Bachelor of Science in Neuroscience (Major) Degree Abbreviation: B.S.

CIP Code (6-digit): 26.1501_____ Level: Bachelor's Degree

CIP Code Title: Not Yet Assigned_____

Does the program require one or more UNC Teacher Licensure Specialty Area Code? Yes_____No__X_

If yes, list suggested UNC Specialty Area Code(s) here _____

If master's, is it a terminal master's (i.e. not solely awarded en route to Ph.D.)? Yes ___ No__X_

Proposed term to enroll first students in degree program: *Term* _____Fall____ *Year* __2018

Provide a brief statement from the university SACSCOC liaison regarding whether the new program is or is not a substantive change. See attachment

Identify the objective of this request (select one or more of the following)

- ☒ Launch new program on campus
- ☐ Launch new program online; Maximum percent offered online _____
  - ☐ Program will be listed in UNC Online
  - ☐ One or more online courses in the program will be listed in UNC Online
- ☐ Launch new site-based program (list new sites below; add lines as needed)
  - ☐ Instructor present (off-campus delivery)
  - ☐ Instructor remote (site-based distance education)

Supply basic program information for UNC Academic Program Inventory (API) and UNC Online

Minimum credit hours required	__120__
Expected number of full-time terms to completion	___8___

Do the following sections of your previously submitted and approved Request to Plan document require any change or updated information? If yes, note the items and explain.

Review Status (Campus)	Yes_____	No__X_____
Description and Purpose	Yes_____	No__X_____
Student Demand	Yes_____	No__X_____
Societal Demand	Yes_____	No__X_____

Unnecessary Duplication	Yes_____	No__X_____
Enrollment	Yes_____	No__X_____

I. Program Requirements and Curriculum

A. Program Planning

1. List the names of institutions with similar degree programs regarded as high quality programs by the developers of the proposed program.

Response: Several institutions provide high quality undergraduate training in neuroscience, including Dartmouth College, Duke University, Johns Hopkins University, Notre Dame University, Ohio State University, University of California at Los Angeles, University of Michigan at Ann Arbor, University of Texas at Austin, and University of Virginia. The establishment of a Neuroscience major at UNC-CH will meet the undergraduate demand for neuroscience on our campus, and substantively strengthen the UNC system in undergraduate neuroscience education.

2. List institutions visited or consulted in developing this proposal. Also discuss or append any consultants' reports or committee findings generated in planning the proposed program.

Response: For the development of this proposal, both during the Request to Plan and the Request to Establish phases, Undergraduate Neuroscience Program Directors at several institutions were contacted, including directors at Boston University, Dartmouth College, Duke University, and University of California at Los Angeles. These individuals shared information regarding curriculum structure, administrative models, and academic advising.

B. Admission. List the following:

1. Admissions requirements for proposed program (indicate minimum requirements and general requirements).

Response: All undergraduate students admitted to UNC-CH (through the Office of Undergraduate Admissions) are eligible to declare the neuroscience degree program. There will not be a separate application process for the neuroscience program (nor a higher GPA requirement for eligibility purposes). Please see the 2017-18 Undergraduate Catalog that describes the Admission Requirements for both first-year students and transfer students (http://catalog.unc.edu/admissions/undergraduate/)

2. Documents to be submitted for admission (listing).

Response: None.

C. Degree requirements. List the following:

1. Total hours required. State requirements for Major, Minor, General Education, etc.

2. Other requirements (e.g. residence, comprehensive exams, thesis, dissertation, clinical or field experience, "second major," etc.).

Response: The neuroscience major is open to all undergraduate students. There are 120 total hours required for the neuroscience major degree, including 23 core/required courses (this number includes pre-requisites for the core courses), as well as 4 elective courses, with 2 courses drawn from each of the two

elective categories. All students are encouraged to participate both in independent research, as well as honors research with neuroscience faculty in any department. Additionally, students must fulfill the General Education requirements in the College. Under the current set of General Education requirements some "core" courses also fulfill the General Education requirements at UNC Chapel Hill (http://catalog.unc.edu/undergraduate/general-education-curriculum-degree-requirements/). Finally, our institution is undergoing a revision of the General Education requirements (http://curriculum2019.web.unc.edu/) and it is anticipated that the number of required General Education credit hours will be reduced.

For graduate programs only, please also answer the following: Response: Not Applicable

3. Proportion of required program courses open only to graduate students
4. Grades required
5. Amount of transfer credit accepted
6. Language and/or research requirements
7. Any time limits for completion

C. For all programs, list existing courses by title and number and indicate (*) those that are required. Include an explanation of numbering system. List (under a heading marked "new") and describe new courses proposed.

Response: The interdisciplinary neuroscience major consists of courses across ten Natural Science Departments in the College of Arts and Sciences, including Biology, Biomedical Engineering, Biostatistics, Chemistry, Computer Science, Mathematics, Exercise and Sport Science, Physics and Astronomy, Psychology and Neuroscience, and Statistics and Operations Research. All students will be encouraged to participate both in independent research, as well as honors research with neuroscience faculty in any department.

For the courses listed below, an asterisk (*) indicates a required course, an open circle (o) represents an elective course in the knowledge domain, and a closed circle (●) indicates an elective course in the mathematics, methods, or statistics domain.

Required

* BIOL 101 Introduction to Biology	**3 credits**
* BIOL 101 L Introduction to Biology Lab	**1**
* BIOL 202 Molecular Biology and Genetics (requires a grade of C or better in BIOL 101 and CHEM 101 or 102)	**4**
* CHEM 101 General Descriptive Chemistry I	**3**
* CHEM 101L General Descriptive Chemistry I Lab	**1**
* CHEM 102 General Descriptive Chemistry II	**3**
* CHEM 102L General Descriptive Chemistry II Lab	**1**
* CHEM 241 Modern Analytical Methods for Separation and Characterization	**2**
* CHEM 241L Modern Analytical Methods for Separation and Characterization Lab	**1**
* CHEM 261 Introduction to Organic I	**3**

* CHEM 262 Introduction to Organic II	**3**
* CHEM 262L Introduction to Organic II	**1**
* COMP 116 Introduction to scientific programming	**3**
* MATH 231 Calculus I	**4**
* MATH 232 Calculus II	**4**
* One from PHYS 104, 114, 116, 119	**4**
* One from PHYS 105, 115, 117, 119	**4**
* PSYC 175 Introduction to Neuroscience	**3**
* PSYC 210 Statistics **OR** STOR 155 Introduction to Data Models and Inference	**3**
* PSYC 270 **OR** BIOL 211 Research Methods	**3-4**
* PSYC 222 Learning	**3**
* PSYC 225 Sensation and Perception	**3**
Knowledge Electives (at least **6** credit hrs)* o BIOL 352 Human Anatomy and Physiology I o BIOL 352L Human Anatomy and Physiology I o BIOL 425 Human Genetics o BIOL 450 Neurobiology o BIOL 455 Behavioral Neuroscience (**OR** PSYC 220) o BIOL 458 Sensory Neurobiology and Behavior o BIOL 552 Behavioral Endocrinology o BIOL 542 Light Microscopy for the biological sciences o BIOL 553 Mathematical and Computational Models in Biology o CHEM 430 Introduction to Biological Chemistry o COMP 401 Foundations of Data Programming o COMP 410 Data Structures o COMP 411 Computer Organization o COMP 555 Bioalgorithms o COMP 560 Artificial Intelligence o COMP 562 Introduction to Machine Learning o COMP 576 Mathematics for Image Computing o COMP 581 Introduction to Robotics o COMP 631 Computer Networks o COMP 633 Parallel and Distributed Computing o COMP 651 Computation Geometry o COMP 665 Images, Graphics, and Vision o EXSS 175 Human Anatomy (OR BIOL 352) o EXSS 275L Human Anatomy Lab o EXSS 276 Human Physiology o EXSS 380 Neuromuscular Control and Learning o PHYS 133 How bio works? o PHYS 405 Biological Physics	**6**

o PSYC 245 Abnormal Psychology o PSYC 320 Drugs and Human Behavior o PSYC 401 Animal Behavior o PSYC 404 Clinical Psychopharmacology o PSYC 415 History of Neuroscience o PSYC 420 Functional Neuroanatomy o PSYC 424 Neural Connections Hands On Neuroscience o PSYC 425 Advanced Perceptional processes o PSYC 426 Molecular Mechanisms of Memory o PSYC 427 Neurobiology of Aging o PSYC 428 Neuroscience Society and the Media o PSYC 429 Neuroeconomics and the Science of Consequence o PSYC 434 Cognitive Neuroscience o PSYC 437 Neurobiology of Learning and Memory o PSYC 469 Evolution and Development of Biobehavioral Systems o PSYC 507 Autism o PSYC 568 Emotion o PSYC 602 Evolutional Psychology	
<u>Mathematics, Methods, and Statistics Electives (at least **6** credit hrs)*</u> ● BIOL 226 Mathematical Methods for Quantitative Biology ● BIOL 226L Mathematical Methods for Quantitative Biology Lab ● BIOS 500H Intro to Biostatistics ● BIOS 610 Biostatistics for laboratory scientists ● BMME 350 Electronics for biomedical engineers ● BMME 351 Human Physiology and biological measurements for bioengineers ● BMME 445 Systems Neuroscience ● BMME 515 Introduction to System Biology ● BMME 550 Medical Imaging: Ultrasonic, Optical, and MR systems ● MATH 241 Biocalculus I ● MATH 283 Biocalculus II ● MATH 383 First course in Differential Equations ● MATH 383L First course in Differential Equations Laboratory ● MATH 406 Mathematical Methods in Biostatistics ● MATH 523 Complex Variables ● MATH 528 Mathematical Methods for the Physical Sciences I ● MATH 528L Mathematical Methods for the Physical Sciences I Laboratory ● MATH 529 Mathematical Methods for the Physical Sciences II ● MATH 529L Mathematical Methods for the Physical Sciences II Laboratory ● MATH 547 Linear Algebra for Applications ● MATH 555 Introduction to Dynamics ● MATH 564 Mathematical Modeling in the Life Sciences (BIOL 534) ● MATH 566 Introduction to Numerical Analysis ● MATH 577 Linear Algebra ● MATH 661 Scientific Computation I	**6**

● MATH 662 Scientific Computation II ● MATH 668 Methods of Applied Mathematics I ● MATH 669 Methods of Applied Mathematics II ● PSYC 402 Advanced Biopsychology ● PSYC 403 Advanced Biopsychology Lab ● PSYC 533 General Linear Model ● STOR 215 Foundations of Decision Sciences ● STOR 415 Introduction to Optimization ● STOR 435 Introduction to Probability ● STOR 445 Stochastic Modeling ● STOR 455 Statistical Methods I ● STOR 555 Mathematical Statistics ● STOR 556 Advanced Methods of Data Analysis ● STOR 565 Machine Learning	
TOTAL CREDIT HOURS	**72-73 hours**

* Electives are intended to provide flexibility and more in-depth instruction for each students' interest in the interdisciplinary field of neuroscience.

II. Faculty

A. (For undergraduate and master's programs) List the names, ranks and home department of faculty members who will be directly involved in the proposed program. The official roster forms approved by SACSCOC may be submitted. For master's programs, state or attach the criteria that faculty must meet in order to be eligible to teach graduate level courses at your institution.

Response: Please see the list below for the names, home departments, and ranks of faculty members who will be directly involved in the undergraduate neuroscience major.

College of Arts and Sciences Faculty:

Name	Department	Rank
Charlotte Boettiger, Ph.D.	Psychology and Neuroscience	Associate Professor
Regina Carelli, Ph.D.	Psychology and Neuroscience	Distinguished Professor
Carol Cheatham, Ph.D.	Psychology and Neuroscience	Associate Professor
Jessica Cohen, Ph.D.	Psychology and Neuroscience	Assistant Professor
Stacey Daughters, Ph.D.	Psychology and Neuroscience	Full Professor
Sylvia Fitting, Ph.D.	Psychology and Neuroscience	Assistant Professor
Kathleen Gates, Ph.D.	Psychology and Neuroscience	Assistant Professor
Kelly Giovanello, Ph.D.	Psychology and Neuroscience	Full Professor
Mark Hollins, Ph.D.	Psychology and Neuroscience	Full Professor
Joseph Hopfinger, Ph.D.	Psychology and Neuroscience	Full Professor
Kristen Lindquist, Ph.D.	Psychology and Neuroscience	Assistant Professor
Donald Lysle, Ph.D.	Psychology and Neuroscience	Distinguished Professor
Keely Muscatell, Ph.D.	Psychology and Neuroscience	Assistant Professor
Montserrat Navarro, Ph.D.	Psychology and Neuroscience	Research Associate Professor

David Penn, Ph.D.	Psychology and Neuroscience	Distinguished Professor
Kathryn Reissner, Ph.D.	Psychology and Neuroscience	Assistant Professor
Margaret Sheridan, Ph.D.	Psychology and Neuroscience	Assistant Professor
Eva Telzer, Ph.D.	Psychology and Neuroscience	Assistant Professor
Todd Thiele, Ph.D.	Psychology and Neuroscience	Full Professor
Stephen Crews, Ph.D.	Biochemistry and Biophysics	Full Professor
Toshihide Hige, Ph.D.	Biology	Assistant Professor
Ken Lohmann, Ph.D.	Biology	Distinguished Professor
Celia Shiau, Ph.D.	Biology	Assistant Professor
Sabrina Burmeister, Ph.D.	Biology	Associate Professor
Paul Dayton, Ph.D.	Biomedical Engineering	Full Professor
Jason Franz, Ph.D.	Biomedical Engineering	Assistant Professor
Caterina Gallippi, Ph.D.	Biomedical Engineering	Associate Professor
Shawn Gomez, Ph.D.	Biomedical Engineering	Associate Professor
Xiaogang Hu, Ph.D.	Biomedical Engineering	Assistant Professor
Helen Huang, Ph.D.	Biomedical Engineering	Full Professor
David Lalush, Ph.D.	Biomedical Engineering	Associate Professor
Gianmarco Pinton, Ph.D.	Biomedical Engineering	Assistant Professor
Joseph Ibrahim, Ph.D.	Biostatistics	Distinguished Professor
Donglin Zeng, Ph.D.	Biostatistics	Full Professor
Jeffrey Dick, Ph.D.	Chemistry	Assistant Professor
Ron Alterovitz, Ph.D.	Computer Science	Associate Professor
Mohit Bansal, Ph.D.	Computer Science	Assistant Professor
Tamara Berg, Ph.D.	Computer Science	Associate Professor
Mark Niethammer, Ph.D.	Computer Science	Associate Professor
Shahriar Nirjon, Ph.D.	Computer Science	Assistant Professor
Stephen Pizer, Ph.D.	Computer Science	Distinguished Professor
Jan Prins, Ph.D.	Computer Science	Full Professor
Martin Styner, Ph.D.	Computer Science	Associate Professor
Troy Blackburn, Ph.D.	Exercise and Sport Science	Full Professor
Kevin Guskiewicz, Ph.D.	Exercise and Sport Science	Distinguished Professor
Jason Mihalik, Ph.D.	Exercise and Sport Science	Associate Professor
Johna Register-Mihalik, Ph.D.	Exercise and Sport Science	Assistant Professor
Brian Pietrosimone, Ph.D.	Exercise and Sport Science	Associate Professor
Erik Wistrom, Ph.D.	Exercise and Sport Science	Assistant Professor
Boyce Griffith, Ph.D.	Mathematics	Associate Professor
Laura Miller, Ph.D.	Mathematics	Full Professor
Peter Mucha, Ph.D.	Mathematics	Full Professor
Katie Newhall, Ph.D.	Mathematics	Assistant Professor
Tamara Branca, Ph.D.	Physics and Astronomy	Assistant Professor
Amy Oldenburg, Ph.D.	Physics and Astronomy	Associate Professor

Yufeng Liu, Ph.D.	Statistics and Operations Research	Full Professor
Andrew Nobel, Ph.D.	Statistics and Operations Research	Full Professor
Vladas Pipiras, Ph.D.	Statistics and Operations Research	Full Professor
Yin Xia, Ph.D.	Statistics and Operations Research	Assistant Professor

Neuroscience Center Faculty (by Medical School Department)

Steven Crews, Ph.D.	Biochemistry & Biophysics	Full Professor
Nikolay Dokholyan, Ph.D.	Biochemistry & Biophysics	Distinguished Professor
Patricia Magness, Ph.D.	Biochemistry & Biophysics	Full Professor
Eva Anton, Ph.D.	Cell Biology & Physiology	Full Professor
Jay Brenman, Ph.D.	Cell Biology & Physiology	Full Professor
Richard Cheney, Ph.D.	Cell Biology & Physiology	Full Professor
Mohanish Deshmukh, Ph.D.	Cell Biology & Physiology	Full Professor
Stephanie Gupton, Ph.D.	Cell Biology & Physiology	Associate Professor
Damaris Lorenzo, Ph.D.	Cell Biology & Physiology	Assistant Professor
Ben Philpot, Ph.D.	Cell Biology & Physiology	Distinguished Professor
Spencer Smith, Ph.D.	Cell Biology & Physiology	Assistant Professor
William Snider, M.D.	Cell Biology & Physiology	Full Professor
Richard Weinberg, Ph.D.	Cell Biology & Physiology	Full Professor
Ellen Weiss, Ph.D.	Cell Biology & Physiology	Full Professor
Mark Zylka, Ph.D.	Cell Biology & Physiology	Distinguished Professor
Jason Stein, Ph.D.	Genetics	Assistant Professor
Lisa Tarantino, Ph.D.	Genetics	Associate Professor
Kirk Wilhelmsen, M.D., Ph.D.	Genetics	Full Professor
Silva Markovic-Plese, M.D., Ph.D.	Microbiology & Immunology	Full Professor
Glenn Matsushima, Ph.D.	Microbiology & Immunology	Full Professor
Jenny Ting, Ph.D.	Microbiology & Immunology	Distinguished Professor
Paul Carney, M.D.	Neurology	Full Professor
Todd Cohen, Ph.D.	Neurology	Assistant Professor
Tim Gerson, M.D.	Neurology	Assistant Professor
Rick Meeker, Ph.D.	Neurology	Full Professor
Ian Shih, Ph.D.	Neurology	Assistant Professor
Serena Dudek, Ph.D.	NIEHS	Senior Investigator
Patricia Jensen, Ph.D.	NIEHS	Senior Investigator
Paul Manis, Ph.D.	Otolaryngology	Full Professor
Ryan Miller, Ph.D.	Pathology	Associate Professor
Fulton Crews, Ph.D.	Pharmacology	Distinguished Professor
Klaus Hahn, Ph.D.	Pharmacology	Distinguished Professor
Melissa Herman, Ph.D.	Pharmacology	Assistant Professor
Tom Kash, Ph.D.	Pharmacology	Distinguished Professor
Bryan Roth, M.D., Ph.D.	Pharmacology	Full Professor
Jude Samulski, Ph.D.	Pharmacology	Distinguished Professor
Juan Song, Ph.D.	Pharmacology	Assistant Professor

Shawn Hingtgen, Ph.D.	Pharmacy	Assistant Professor
Aysenil Belger, Ph.D.	Psychiatry	Full Professor
Joyce Besheer, Ph.D.	Psychiatry	Associate Professor
Gabriel Dichter, Ph.D.	Psychiatry	Associate Professor
Flavio Frohlich, Ph.D.	Psychiatry	Assistant Professor
John Gilmore, M.D.	Psychiatry	Distinguished Professor
Clyde Hodge, Ph.D.	Psychiatry	Full Professor
Hiroyuki Kato, Ph.D.	Psychiatry	Assistant Professor
Rebecca Santelli-Knickmeyer, Ph.D.	Psychiatry	Associate Professor
Zoe McElligott, Ph.D.	Psychiatry	Assistant Professor
Leslie A. Morrow, Ph.D.	Psychiatry	Full Professor
Joseph Piven, M.D.	Psychiatry	Distinguished Professor
Donita Robinson, Ph.D.	Psychiatry	Associate Professor
Garret Stuber, Ph.D.	Psychiatry	Associate Professor
Patrick Sullivan, M.D.	Psychiatry	Distinguished Professor
Eran Dyan, Ph.D.	Radiology	Assistant Professor
Weili Lin, Ph.D.	Radiology	Distinguished Professor

B. (For doctoral programs) List the names, ranks, and home department of each faculty member who will be directly involved in the proposed program. The official roster forms approved by SACSCOC may be submitted. Provide complete information on each faculty member's education, teaching and research experience, research funding, publications, and experience directing student research including the number of theses and dissertations directed.

Response: Not Applicable

C. Estimate the need for new faculty for the proposed program over the first four years. If the teaching responsibilities for the proposed program will be absorbed in part or in whole by the present faculty, explain how this will be done without weakening existing programs.

Response: The new neuroscience major will not require the hiring of any new faculty. However, it is anticipated that new undergraduate neuroscience courses will be proposed as new faculty with neuroscience training and expertise are hired over the coming years.

D. Explain how the program will affect faculty activity, including course load, public service activity, and scholarly research.

Response: The neuroscience major consists of courses already offered in the College of Arts and Science and School of Public Health by faculty in the ten signatory units. As such, it is anticipated that the neuroscience major will have little to no negative impact on faculty course load, public service activity, or scholarly research. However, a positive outcome of the neuroscience major would be additional undergraduate research assistants eager to learn the knowledge and technical skills of neuroscientific research.

III. Delivery Considerations. Provide assurances of the following:

A. *Access* (online, site-based distance education, and off-campus programs). Students have access to academic support services comparable to services provided to on-campus students and appropriate to support the program, including admissions, financial aid, academic advising, delivery of course materials, and placement and counseling.

Response: Not applicable

B. *Curriculum delivery* (online and site-based distance education only). The distance education technology to be used is appropriate to the nature and objectives of the program. The content, methods and technology for each online course provide for adequate interaction between instructor and students and among students.

Response: Not applicable

C. *Faculty development* (online and site-based distance education only). Faculty engaged in program delivery receive training appropriate to the distance education technologies and techniques used.

Response: Not applicable

D. *Security* (online and site-based distance education only). The institution authenticates and verifies the identity of students and their work to assure academic honesty/integrity. The institution assures the security of personal/private information of students enrolled in online courses.

Response: Not applicable

IV. Library

A. Provide a statement as to the adequacy of present library holdings for the proposed program to support the instructional and research needs of this program.

Response: No additional library holdings are needed to support the instructional and research needs of the program. For example, faculty in the Department of Psychology and Neuroscience, as well as in the Neuroscience Center, have thriving research programs that are supported by the current UNC-CH library holdings and journal subscriptions. Additionally, the current holdings are used to support the instructional mission of all ten signatory departments (from which the courses for the neuroscience major are drawn).

B. If applicable, state how the library will be improved to meet new program requirements for the next four years. The explanation should discuss the need for books, periodicals, reference material, primary source material, etc. What additional library support must be added to areas supporting the proposed program?

Response: Not Applicable

C. Discuss the use of other institutional libraries.

Response: All undergraduate students at UNC-CH are able to utilize other institutional libraries via the inter-library loan program.

V. Facilities and Equipment

A. Describe facilities available for the proposed program.

Response: The neuroscience undergraduate major will use the existing research and teaching facilities in the nine signatory academic departments in the UNC-CH College of Arts and Sciences (Biology, Biomedical Engineering, Chemistry, Computer Science, Mathematics, Exercise and Sport Science, Physics and Astronomy, Psychology and Neuroscience, and Statistics and Operations Research) and in the School of Public Health (Biostatistics), as well as at the Neuroscience Center. For example, in the Department of Psychology and Neuroscience (http://psychology.unc.edu/message-from-the-chair/) there are 19 faculty members with expertise and training in neuroscience. Undergraduate neuroscience major will have the opportunity to enroll in courses taught by these faculty members, as well as participate in research projects in their laboratories. Beyond the individual faculty laboratories, the Department is equipped with several core resources available for neuroscientific research, including a state-of-the art electroencephalogram (EEG) system, physiological equipment, a mock MRI scanner, and confocal microscope. These tools are used to uncover basic neuroscience mechanisms that contribute to healthy and disordered mental processes. Additionally, several of the faculty members in the Department of Psychology and Neuroscience use the world-class human neuroimaging core lab facilities in the UNC-CH Biomedical Research Imaging Center (http://www.med.unc.edu/bric) to link behavioral phenomena with brain structure and function. Finally, the Neuroscience Center includes numerous faculty affiliated with several different medical school departments, all of whom conduct research that centers on neuroscientific questions (please see the list of Neuroscience Center faculty). Additionally, the Neuroscience Center offers several core Laboratories (http://www.med.unc.edu/neuroscience/core-facilities) including confocal and multiphoton imaging, bioinformatics, as well as a wide array of other core facilities (http://www.med.unc.edu/corefacilities).

More broadly, neuroscience majors will have access to all the academic and research resources referenced in the Undergraduate Catalog (e.g., Learning Center, Writing Center, Advising - including Pre-Graduate School Advising): http://catalog.unc.edu/resources/academic-research/. Finally, the Carolina Center for Student Success and Academic Counseling (https://cssac.unc.edu/) is dedicated to promoting academic excellent to assist students in achieving their academic goals while enrolled at Carolina. Its constituent programs (Learning Center, Peer Mentoring, Summer Bridge, Men of Color Engagement and Writing Center) provide support for students in developing the skills and strategies needed to achieve academic success. This commitment to student learning supports the university's mission to "teach students at all levels."

B. Describe the effect of this new program on existing facilities and indicate whether they will be adequate, both at the commencement of the program and during the next decade.

Response: Based on data collected during the Request to Plan phase, it is anticipated that there will be approximately 100 new neuroscience majors declaring each year, with approximately 80% of those students completing the program. In discussions with the Chairs of the ten Signatory Units, as well as conversations with each unit's representative on the neuroscience major Executive Advisory Committee (EAC), it is believed that there will be minimal impact on the existing facilities at the commencement of the program. However, with substantial growth of the major over the next ten years, the effect of the neuroscience major on existing facilities will need to be reassessed.

C. Describe information technology and services available for the proposed program.

Response: As part of the College of Arts and Sciences and School of Public Health, the ten sponsoring signatory departments receive IT services from OASIS and ITS. No additional IT support is required for the neuroscience major.

D. Describe the effect of this new program on existing information technology and services and indicate whether they will be adequate, both at the commencement of the program and during the next decade.

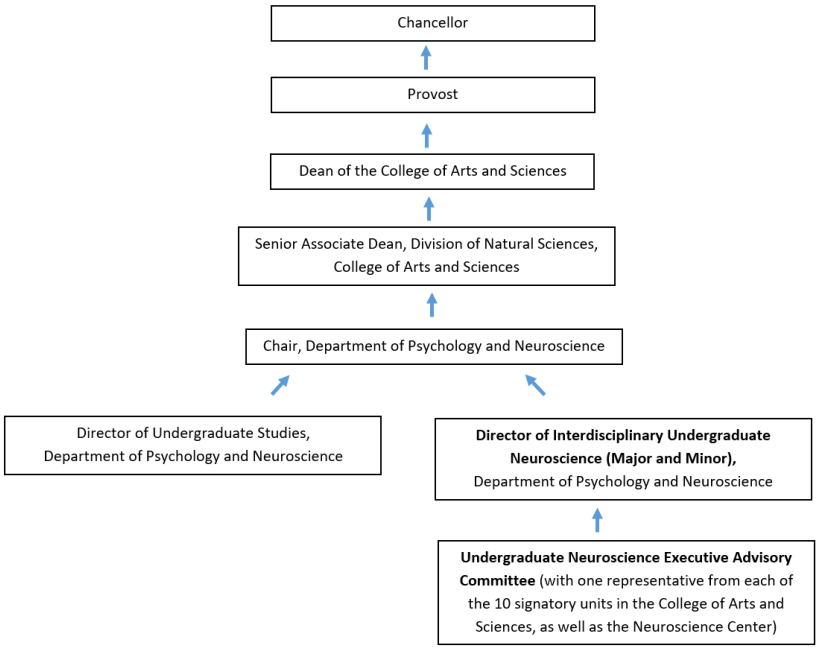
Response: The neuroscience major will require no additional IT support beyond what is already utilized by the ten signatory departments. This support is appropriate at the commencement of the program, and anticipated not to change over the next decade.

VI. Administration

A. Describe how the proposed program will be administered, giving the responsibilities of each department, division, school, or college. Explain any inter-departmental or inter-unit administrative plans. Include an organizational chart showing the "location" of the proposed new program.

Response: An Executive Advisory Committee (EAC) has been established for the neuroscience major. The EAS is composed of a single representative from each of the ten signatory departments, a representative from the Neuroscience Center, and a Committee Chair. The twelve members of the EAC are: Drs. Todd Austell (Chemistry), Steve Crews (Biology), Jason Fine (Biostatistics), Kelly Giovanello (EAC Chair), Boyce Griffith (Mathematics), Xiaogang Hu (Biomedical Engineering), Jason Mihalik (Exercise and Sport Science), Marsha Penner (Psychology and Neuroscience), Jan Prins (Computer Science), Garrett Stuber (Neuroscience Center), Sean Washburn (Physics and Astronomy) and Kai Zhang (Statistics and Operations Research). The EAC will make broad intellectual contributions to the major, including yearly review of required courses and curriculum development, and will provide a critical link between the units to guide and revise the major in the years to come. The Department of Psychology and Neuroscience has been designated as the "administering department" and will conduct annual SACS assessments to monitor and improve the quality of undergraduate education in the neuroscience major. These activities will be reviewed by the EAC annually. Please see the organizational chart (below) showing the "location" of the proposed neuroscience major:

Organizational Chart Showing the "Location" of the Proposed Neuroscience Major



B. For joint programs only, include documentation that, at minimum, the fundamental elements of the following institutional processes have been agreed to by the partners:

1. Admission process
2. Registration and enrollment process for students
3. Committee process for graduate students

4. Plan for charging and distributing tuition and fees
5. Management of transcripts and permanent records
6. Participation in graduation
7. Design of diploma

Response: Not Applicable

VII. Accreditation and Licensure

A. Where appropriate, describe how all licensure or professional accreditation standards will be met, including required practica, internships, and supervised clinical experiences.

Response: There are no licensure or professional accreditation standards for the undergraduate major in neuroscience.

B. Indicate the names of all accrediting agencies normally concerned with programs similar to the one proposed. Describe plans to request professional accreditation.

Response: Not Applicable

C. If the new degree program meets the SACSCOC definition for a substantive change, what campus actions need to be completed by what date in order to ensure that the substantive change is reported to SACSCOC on time?

Response: Not Applicable

D. If recipients of the proposed degree will require licensure to practice, explain how program curricula and title are aligned with requirements to "sit" for the licensure exam.

Response: Not Applicable

VIII. Supporting Fields. Discuss the number and quality of lower-level and cognate programs for supporting the proposed degree program. Are other subject-matter fields at the proposing institution necessary or valuable in support of the proposed program? Is there needed improvement or expansion of these fields? To what extent will such improvement or expansion be necessary for the proposed program?

Response: There are no lower-level and cognate programs supporting the proposed neuroscience major.

IX. Additional Information. Include any additional information deemed pertinent to the review of this new degree program proposal.

a. How does the proposed program align with system, institutional and unit missions and strategic plans?

Response: The proposed neuroscience major aligns very well with the system, institutional and unit missions and strategic plans. As part of the 2017 Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) accreditation process, UNC-Chapel Hill has adopted the Quality Enhancement Plan (QEP) with the theme of "Creating Scientists: Learning by Connecting, Doing, and Making." The proposed neuroscience major explicitly meets the learning objectives of "Connecting", "Doing", and "Making". "Connecting" refers not only to the complex connections within science models, but also explicitly links the arts and humanities with the sciences such that students increase their critical thinking and communication

skills. Undergraduate neuroscience courses currently offered by faculty in the Department of Psychology and Neuroscience at UNC-CH (e.g. "Neural Connections") combine neuroscientific research with art, elementary education, and community outreach programs. Moreover, due to the highly interdisciplinary nature of the field, undergraduate neuroscience courses stress the importance of connecting information across multiple scientific fields. The learning objective of "Doing" promotes increasing collaborative experiences that demonstrate the non-linear process of science through research so that students understand the importance of collaboration, discovery, and iteration in science. The new neuroscience major strongly encourages students to participate in research via independent studies or honors thesis research in neuroscience labs. In the lab context, students enrolled in the neuroscience major will experience and learn to navigate the complicated, uncertain, and rewarding process of science. **"**Making" refers to the synthesis of data and novel ideas, and explicitly accents the idea that the scientific process often leads to tangible objects, findings, or products. Through experiential learning courses and lab-based research opportunities, undergraduates enrolled in the neuroscience major will experience that novel ideas and products arise through neuroscientific research. Additionally, students will have the opportunity to present their research to other students and scholars (see http://our.unc.edu/resources/qep/). Finally, at the unit level, the Department of Psychology and Neuroscience currently offers an undergraduate minor concentration in neuroscience. In light of the substantial student demand, the neuroscience major will allow us to extend the study of neuroscience for our undergraduate students.

X. Budget

A. Complete and insert the Excel budget template provided showing incremental continuing and one-time costs required each year of the first four years of the program. Supplement the template with a budget narrative for each year.

Response: No additional funds are being requested for this proposed degree.

B. Based on the campus' estimate of available existing resources or expected non-state financial resources that will support the proposed program (e.g., federal support, private sources, tuition revenue, etc), will the campus:

Response: No additional funds are being requested for this proposed degree.

1. Seek enrollment increase funds or other additional state appropriations (both one-time and recurring) to implement and sustain the proposed program? If so, please elaborate.

2. Require differential tuition supplements or program-specific fees? If so, please elaborate.
    a. State the amount of tuition differential or program-specific fees that will be requested.

    b. Describe specifically how the campus will spend the revenues generated.

    c. Does the campus request the tuition differential or program-specific fees be approved by the Board of Governors prior to the next Tuition and Fee cycle?

C. If enrollment increase funding, differential tuition, or other state appropriations noted in the budget templates are not forthcoming, can the program still be implemented and

sustained and, if so, how will that be accomplished? Letters of commitment from the Chancellor and/or Chief Academic Officer should be provided.

Response: No additional funds are being requested for this proposed degree.

XI. Evaluations Plans.

A. Criteria to be used to evaluate the quality and effectiveness of the program, including academic program student learning outcomes.

Response: The Department of Psychology and Neuroscience has been designated as the administering unit for the neuroscience major and will conduct annual SACS assessments to monitor and improve the quality of undergraduate education in the major. In initiating this process, we have identified five key learning outcomes for neuroscience undergraduate majors. These include: (1) demonstrating an adequate knowledge base of the field (e.g., a mastery of nervous system anatomy to understand the relations between structure and function), (2) understanding and applying basic concepts in research methodology, (3) using critical thinking skills, (4) applying neuroscience principles to complex disorders of the central and peripheral nervous system and considering what the study of neuroscience can offer toward understanding and treatment, and (5) evidencing strong ethical principles. In general, extensive analytical and communication skills will be acquired through the neuroscience major, including data analytic techniques, project management, communication, computer and technical skills, leadership, problem solving and critical thinking, and writing.

B. Measures (metrics) to be used to evaluate the program (include enrollments, number of graduates, and student success).

Response: Annual measurement of enrollment, number of students participating in mentored research, number of graduates, and number of students immediately entering graduate or professional schools will be conducted.

C. The plan and schedule to evaluate the proposed new degree program prior to the completion of its fourth year of operation.

Response: The neuroscience major will undergo yearly review using the learning outcomes listed in XI. A. (one per year for the first 5 years), as well as annual measurement of the metrics listed in XI. B. Please see the table below for more details.

Assessment Plan for Neuroscience B.S. Degree		
Learning Goals	Assessment Procedures	Year of Assessment
Knowledge Base: Demonstrate familiarity with the major concepts, theoretical perspectives, empirical findings, and trends in neuroscience including its links to other science disciplines.	Students successfully pass with a C or better core and elective courses as specified in our curriculum. Conduct electronic audit of the previous year's graduating seniors; determine how many have earned C or better in which courses.	2019; 2024; 2028
Research Methods:	(a) Analysis of a random sample of final research papers from Research	2020; 2023;

Understand and apply basic research methods in neuroscience including research design, data analysis, and interpretation.	Methods course (e.g., PSYC 270) by a committee of instructors. (b) A majority of students successfully complete a research-intensive course in neuroscience.	2027
Critical Thinking Skills: Respect and use critical and creative thinking, skeptical inquiry, and the scientific approach to solve questions related to neuroscience.	Analysis of a random sample of course papers taken from at least 4 senior-level courses by a committee of instructors.	2021; 2025; 2029
Application: Understand and apply neuroscience principles to complex disorders of the central and peripheral nervous system and what the study of neuroscience can offer toward understanding and treatment.	(a) A majority of students successfully complete an applied course in neuroscience (e.g., Neural Connections) (b) Analysis of a random sample of course papers taken from at least 4 senior-level courses by a committee of instructors to determine if students understand and apply neuroscience principles to complex mechanisms and disorders of the central and peripheral nervous system.	2021; a: 2024; b: 2025; a: 2028
Values: Value empirical evidence, tolerate ambiguity, act ethically, and reflect other values that are the underpinning of neuroscience as a science.	Students in upper-level neuroscience curriculum courses will complete a brief survey assessing the extent to which their instructor, the course material, and the classroom atmosphere fostered the values specified.	2022; 2026; 2030

XII. Attachments. Attach the final approved Request to Plan as the first attachment following this document.

Response: Please see the attached final approved Request to Plan, including letters of support from the ten Chairs of Natural Science Departments whose units contribute courses to the new neuroscience major.

This proposal to establish a new degree program has been reviewed and approved by the appropriate campus committees and authorities.

Chancellor: _____Date:_____

SAMPLE PLAN: Neuroscience Major (B.S.)			
First Year (fall)	**Hrs**	**First Year (spring)**	**Hrs**
ENGL 105 (CR)	3	COMP 116 (QR)	3
PSYC 175 (PL)	3	Approaches[2] (e.g., VP)	3
MATH 231 (QR)	4	MATH 232 (QI)	4
BIOL 101/101L (PX)	4	Foreign Language level 2 (FL)	3
Lifetime Fitness (LFIT)	1	CHEM 101/101L (PX)	4
subtotal:	**15**	**subtotal:**	**17**
Sophomore Year (fall)	**Hrs**	**Sophomore Year (spring)**	**Hrs**
CHEM 102/102L (PX)	4	Approaches[2] (e.g., PH)	3
Foreign language level 3 (FL)	3	CHEM 241	2
STOR 155 or PSYC 210 (QR/QI)	3	CHEM 241L	1
Approaches[2] (e.g., SS/HS)	3	BIOL 202	4
Elective	3	Elective	4
subtotal:	**16**	**subtotal:**	**14**
Junior Year (fall)	**Hrs**	**Junior Year (spring)**	**Hrs**
PSYC 270 (PX, EE)[1]	4	PHYS 105, 115, 117, OR 199	4
PHYS 104 114, 116, OR 119	4	CHEM 262	3
CHEM 261	3	CHEM 262L	1
Elective	3	Group 1, course #1	3
		Approaches[2] (e.g., LA)	3
		Elective	1
subtotal:	**14**	**subtotal:**	**15**
Senior Year (fall)	**Hrs**	**Senior Year (spring)**	**Hrs**
Group 2, course #1	3	Group #2, course #2	3
Group 1, course #2	3	PSYC 222 (PL)	3
Approaches[2] (e.g., HS)	3	Approaches[2] (e.g., SS)	3
PSYC 225 (PL)	3	Elective	4
Elective	3	Elective	1
subtotal:	**15**	**subtotal:**	**14**
		DEGREE TOTAL:	**120**

[1] OR BIOL 211 (3 credits)

[2] The remaining Connections requirements (NA, BN, US, GL, WB, CI) should overlap with Approaches courses

THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

OFFICE OF INSTITUTIONAL RESEARCH AND ASSESSMENT

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http://oira.unc.edu

MEMORANDUM

DATE: October 26, 2017

TO: UNC General Administration

FROM: Lynn Williford, Assistant Provost for Institutional Research & Assessment,
UNC-Chapel Hill SACSCOC Accreditation Liaison

I have reviewed the Request to Establish a New Degree Program for the BS in Neuroscience. This major does not represent a significant departure from other undergraduate natural sciences programs that UNC-Chapel Hill is approved by SACSCOC to offer, such as Biology, Chemistry, Geological Sciences, Physics, Exercise and Sports Science, and Psychology. There are no factors that would qualify it as a substantive change for this institution.