



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

DEPARTMENT OF PSYCHOLOGY AND NEUROSCIENCE

DAVIE HALL
CAMPUS BOX 3270
CHAPEL HILL, NC 27599-3270

T 919.843.5467
F 919.962.2537
psychology.unc.edu

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

April 14, 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 Plan 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 322 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, 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



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



Beth Kurtz-Costes, Ph.D.
Distinguished Professor and Director of Undergraduate Studies
Department of Psychology and Neuroscience

UNIVERSITY OF NORTH CAROLINA

REQUEST TO PLAN

A NEW DEGREE PROGRAM – ANY DELIVERY METHOD

THE PURPOSE OF ACADEMIC PROGRAM PLANNING: Planning a new academic degree program provides an opportunity for an institution to make the case for need and demand and for its ability to offer a quality program. The notification and planning activity described below do not guarantee that authorization to establish will be granted.

Date: April 14, 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)

Site #1

(address, city, county, state)

(max. percent offered at site)

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

Minimum credit hours required _____

Expected number of full-time terms to completion _____

1. Review Status.

- a. List the campus bodies that reviewed and commented on this request to Plan proposal before submission to UNC General Administration. What were their determinations? Include any votes, if applicable.

Response: Several campus bodies at UNC-CH have reviewed and commented on this request to Plan proposal, including:

- Office of the Chancellor (pending)
- Office of the Provost and Executive Vice Chancellor (pending)
- Administrative Boards of the College (pending)
- Office of the Dean of the College of Arts and Sciences
- Department of Psychology and Neuroscience, College of Arts and Sciences:
Department Chair, Faculty, and Undergraduate Studies Committee

- b. Summarize any issues, concerns or opposition raised throughout the campus process and comment periods. Describe revisions made to address areas of concern.

Response: A committee to establish a new undergraduate major in neuroscience was formed to assess the feasibility of creating the new major. The committee gathered curricula information on neuroscience programs at peer institutions across the United States, identified the declared undergraduate majors of current students pursuing the neuroscience minor at UNC-CH, selected field-relevant courses from the undergraduate course catalog, met with Department Chairs of Natural Science Departments in the College of Arts and Sciences, and met with the Senior Associate Dean of Natural Science, and the Dean of the College of Arts and Sciences. During this process, the proposal for a new undergraduate neuroscience major at UNC-CH received overwhelming, enthusiastic support. Only two concerns were raised. First, faculty within the department of Psychology and Neuroscience expressed concern that the creation of a new neuroscience major may strain resources in the department dedicated to undergraduate psychology majors (i.e., BA in Psychology; BS in Psychology). However, based on data collected from students with declared majors in psychology, coupled with declared minors in neuroscience, it was determined that many students already in the department as psychology majors may switch to a neuroscience major. Moreover, since neuroscience is a highly interdisciplinary field, the composition of the proposed neuroscience major curriculum draws from courses throughout the College. As such, strain on existing department resources would be minimized. Second, while meeting with other Natural Science Chairs in the College, it became apparent that other departments, in addition to the Department of Psychology and Neuroscience were interested in intellectually co-sponsoring the major. In light of this, the Neuroscience major will be intellectually co-sponsored by all signatory departments within the College of Arts and Sciences. Additionally, an executive advisory committee will be established that will make broad and substantial intellectual contributions to the design of the major, including required courses and curriculum development. This executive advisory committee will be composed of a single representative from each of the 10 signatory departments.

2. 2. Description and Purpose

- a. a. Provide a 250-word or less description of the proposed program, including target audience, delivery method, hours required, program core and concentrations (if applicable), post-graduate outcomes for which graduates will be prepared, and other special features. For programs with an online component, describe whether the delivery is synchronous with an on-campus course, partially synchronous, asynchronous, or other.

Response: Neuroscience embodies the liberal arts experience because it draws on techniques and findings from several academic disciplines. The interdisciplinary neuroscience major consists of courses across several academic departments in the College of Arts and Sciences at UNC-CH, including, Biology, Chemistry, Computer Science, Mathematics, Exercise and Sports Science, Physics, Psychology and Neuroscience, and Statistics and Operations Research. The neuroscience major is open to all undergraduate students. Students are required to complete 24 core courses, as well as 4 elective courses, with 2 drawn from each of two elective categories, totaling 120 credit hours. Given that these courses are taught by faculty across several academic units in the College, we met with the Chairs of each impacted unit. Each Chair has graciously given his or her approval for the Neuroscience major application and provided a letter of support (please see attached letters). Additionally, all students are encouraged to participate both in independent research, as well as honors research in neuroscience with faculty in any department. To this end, each Chair letter includes the names of faculty members in that unit who have the required training and who have expressed interest in mentoring undergraduate neuroscience research. This new major 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 human development and aging, health and disease, rehabilitation, biomedical research, human-machine interactions, and other emerging disciplines.

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

Response: 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/gep/>). Finally, at the unit level, the Department of Psychology and Neuroscience currently offers an undergraduate minor concentration in neuroscience. In light of student demand (please see next section), the neuroscience major will allow us to extend the study of neuroscience for our undergraduate students.

- a. c. What student-level educational objectives will be met by the proposed program?

Response: 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. With regard to acquisition of discipline knowledge, the student-level educational objectives to be met by the neuroscience major are five-fold, including: (1) a mastery of nervous system anatomy to understand the relations between structure and function; (2) an examination of brain and neural networks that mediate behavior and cognition throughout the lifespan; (3) exposure to the major research methods employed in the field of neuroscience; (4) a consideration of complex disorders of the central and peripheral nervous system and what the study of neuroscience can offer toward understanding and treatment; and (5) the impact of individual differences on neural processes, and its relation to individualized medicine. These objectives will be attained by extensive reading of textbooks and peer-reviewed scientific journal articles, preparation of written documents, and other related course and laboratory work.

3. Student Demand. Provide documentation of student demand. Discuss the extent to which students will be drawn from a pool of students not previously served by the institution.

Response: 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 Carolina Neuroscience Club, 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). The CNC invites professors, post-doctoral fellows, and graduate students to discuss their research and careers in neuroscience. To date, the club has hosted several panels of guest speakers to answer questions related to pursuing neuroscience at UNC and beyond. 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 and established a new neuroscience minor that was launched in Fall 2015. Currently, there are 322 declared neuroscience minors. The neuroscience minor consists of one required course (i.e., Introduction to Neuroscience) and 4 elective courses drawn from at least two academic departments. A complete listing of the courses included in the neuroscience minor may be viewed at <http://psychology.unc.edu/minor-requirements/>.

A major in neuroscience would provide students with significantly more focused, 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 provide undergraduate training in neuroscience, including Duke University, Eastern Carolina 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 UNCH-CH will meet the undergraduate demand for neuroscience on our campus, and substantively strengthen the UNC system in undergraduate neuroscience education.

4. Societal demand. Provide evidence of societal demand and employability of graduates from each of the following source types.

- i. a. Labor market information (projections, job posting analyses, and wages)
- ii. i. specific to North Carolina (such as ncworks.gov, nctower.com, outside vendors such as Burning Glass)

Response: Students with a bachelor of science degree in neuroscience excel at data analysis, project management, communication, computer and technical skills, teaching and leadership, problem solving and critical thinking, patience, dealing with setbacks, and writing. A major in Neuroscience prepares students for graduate studies in neuroscience and related fields (genetics, biochemistry, physiology, microbiology, marine biology, cell biology, and medical illustration), entry into professional schools (medicine, dentistry or other health related fields), and employment in industrial and pharmaceutical companies (pharmaceutical sales, product manager, marketing/sales representative, research and design director, and quality control analyst). Within the state of North Carolina, there are numerous academic and research institutions (both within the UNC system and at private universities, colleges, and centers), as well as industrial and pharmaceutical companies, especially within the Research Triangle Area, that would hire individuals with training in neuroscience. Several searches on ncworks.gov yielded hundreds of available positions for individuals with the aforementioned education and skill sets.

- i. ii. available from national occupational and industry projections (such as BLS).

Response: Neuroscience is expecting a job growth of about 8% from 2014 to 2024, a strong job growth rate when compared to other professions. Factors leading to this growth include an aging population, new discoveries leading to new areas of research, and an increasing utilization of medications. Government funding for research will also continue to influence the demand for this specialty (source: [*"Medical Scientists : Occupational Outlook Handbook: : U.S. Bureau of Labor Statistics"*](#))

- i. b. Projections from professional associations or industry reports

Response: Neuroscience jobs are available in a variety of industries. The term "neuroscientist" is used broadly to describe one who works in this field, but many of these scientists pursue a career in a specialized area of neuroscience. Some specialty areas involve the study of the

nervous system or brain themselves, while others involve the study of how the nervous system and brain interact with external or internal factors. Government agencies, universities, industry, hospitals, and medical centers are all settings for neuroscience jobs. Private research foundations, government laboratories, and regulatory agencies, such as the National Institutes of Health (NIH), Food and Drug Administration (FDA), and Environmental Protection Agency (EPA), all have research and administrative positions for neuroscientists. Universities offer teaching and brain research opportunities. Industries such as pharmaceutical, chemical, biotechnology, and medical instruments provide jobs for researchers or leaders of research teams—often paying better than comparable government positions. In an industrial setting, neuroscientists have the opportunity to research and develop new products without having additional teaching responsibilities. Salary ranges for neuroscience careers vary due to the different types of work an individual can do and the different types of employers.

- i. c. Other (alumni surveys, insights from existing programs, etc.)

Response: Existing programs at peer institutions (e.g., Ohio State University, University of California at Los Angeles, and University of Michigan) report that their graduates with a B.S. in neuroscience successfully secure careers in/as: Pharmaceutical sales, laboratory technician, psychometrist, science writer, science advocacy, health educator, medical or healthcare manager, forensic science technician, pharmacy technician, public policy, residential counselor, regulatory affairs specialist, clinical research assistant, special education assistant, lab animal care technician, sales engineer, law enforcement, natural sciences manager, and advertising/marketing.

5. Unnecessary duplication.

- a. List all other public and private four-year institutions of higher education in North Carolina currently operating programs similar to the proposed new degree program, including their mode of delivery. Show a four-year history of enrollments and degrees awarded in similar programs offered at other UNC institutions (using the format below for each institution with a similar program); describe what was learned in consultation with each program regarding their experience with student demand and job placement. Indicate how their experiences influenced your enrollment projections.

Response: There are two existing undergraduate neuroscience major programs in the state of North Carolina. These programs are the (1) Multidisciplinary Studies Major with a Concentration in Neuroscience at East Carolina University and (2) the Neuroscience Major at Duke University. The current application was written after consultation with the directors of these programs, as well as at peer institutions in the United States.

Institution: East Carolina University

Program Title: Multidisciplinary Studies Major: Neuroscience Concentration

| | (2015-2016) | (2014-2015) | (2013-2014) | (2012-2013) |
|-----------------|-------------|-------------|-------------|-------------|
| Enrollment | 103 | 83 | 79 | 70 |
| Degrees-awarded | 7 | 10 | 12 | 10 |

Program Specific Information: The Multidisciplinary Studies Major with a Concentration in

Neuroscience began at ECU in 2004. Over the last 5 years, approximately 25 new students have enrolled each year, with some students completing the major requirements for graduation and other students changing to a different major. Professor Tran in the Department of Psychology serves as director of the major. All courses are taught face-to-face in lecture-format or lab-based formats, with the exception of one section of the "Introduction to Neuroscience" course that is offered online. The major requires at least two research courses, and honors thesis research in neuroscience is highly encouraged.

Institution: Duke University

Program Title: Multidisciplinary Studies Major: Neuroscience

| | (2015-2016) | (2014-2015) | (2013-2014) | (2012-2013) |
|-----------------|-------------|-------------|-------------|-------------|
| Enrollment | 84 | 84 | 98 | 83 |
| Degrees-awarded | 38 | 36 | 39 | 26 |

Program Specific Information: The Neuroscience major at Duke is administered through the Duke Institute for Brain Sciences and Directed by Professor Kevin LaBar in the Department of Psychology and Neuroscience. Students cannot declare the neuroscience major until their sophomore year. As such, the numbers in the table reflect sophomores, juniors, and seniors. All courses are offered face-to-face with the exception of one course on visual perception and one course on anatomy. Although a senior honors thesis in neuroscience is not required, it is strongly encouraged.

- b. Identify opportunities for collaboration with institutions offering related degrees and discuss what steps have been or will be taken to actively pursue those opportunities where appropriate and advantageous.

Response: During conversations with Professors Tran and LaBar, directors of the neuroscience undergraduate majors at ECU and Duke, respectively, several opportunities for collaboration were identified. First, because ECU is a member of the UNC System, UNC-CH students may easily take the ECU on-line Introduction to Neuroscience course for credit, then have that credit transferred to UNC-CH. Relatedly, UNC and Duke have reciprocal relations with regard to undergraduate courses, with students at each institution able to enroll in courses at the other institution, thereby broadening the course options available to students. This is an important issue since all institutions have limited resources and a limited ability to offer a wide array of neuroscience courses in a single semester. Second, with regard to research opportunities, students often look for research lab placements, particularly during the summer months. Dr. Tran expressed interest in collaborating to place ECU students living in the Triangle Area during the summer in research positions at UNC, and reciprocally, helping to identify labs at ECU for UNC-CH students living in that area during the summer.

- c. Present documentation that the establishment of this program would not create unnecessary program duplication. In cases where other UNC institutions provide similar online, site-based distance education, or off-campus programs, directly address how the

proposed program meets unmet need.

Response: Only one other UNC Institution - East Carolina University (ECU) – offers undergraduates the option to major in the field of Neuroscience. In speaking with Dr. Tran (Director for the Neuroscience major at ECU), it quickly became apparent that there would be minimal overlap between the current application for a neuroscience major at UNC-CH and the existing ECU multidisciplinary major in neuroscience. First, all but one of ECU's undergraduate neurosciences courses are taught face-to-face on-site. Given the distance between Chapel Hill and Greenville, it is unreasonable for students at UNC-CH to drive multiple times per week to attend neuroscience courses at ECU. Second, the current application strongly encourages undergraduates to pursue active research learning opportunities in labs at UNC-CH conducting neuroscience research. Given that individual faculty who contribute to the neuroscience majors at each institution differ, undergraduates at UNC-CH and ECU will have unique opportunities to conduct neuroscientific research.

6. Enrollment. Estimate the total number of students that would be enrolled in the program during the first year of operation and in each delivery mode (campus, online, site – add lines as needed):

Delivery Mode ___ *Full-Time* ___100___ *Part-Time* _____

Estimate the total number of students that would be enrolled in the program during the fourth year of operation and in each delivery mode (campus, online, site – add lines as needed):

Delivery Mode ___ *Full-Time* ___400___ *Part-Time* _____

7. Resources. Will any of the resources listed below be required to deliver this program? (If yes, please briefly explain in the space below each item, state the estimated new dollars required at steady state after four years, and state the source of the new funding and resources required.)

a. New Faculty: Yes _____ No X _____

b. Faculty Program Coordination: Yes _____ No X _____

c. Additional Library Resources: Yes _____ No X _____

d. Additional Facilities and Equipment: Yes _____ No X _____

e. Additional Other Program Support: Yes _____ No X _____

(for example, additional administrative staff, new Master's program graduate student assistantships, etc.)

8. Curriculum leverage. Will the proposed program require development of any new courses? If yes, briefly explain.

Response: The new neuroscience major will not require the development of any new courses. However, it is anticipated that new undergraduate neuroscience courses will be proposed by current (and future) faculty to be timely with this evolving discipline.

9. Funding Sources. Does the program require enrollment growth funding in order to be implemented and sustained? If so, can the campus implement and sustain the program should enrollment growth funding be unavailable? Letters of commitment should be provided.

9a. For graduate programs only: Response: Not Applicable.

Does the program require a tuition differential or program specific fee in order to be implemented and sustained?

- a. i. If yes, state the amount of tuition differential or fee being considered, and give a brief justification.
- a. ii. Can the campus implement and sustain the program if the tuition differential or program fee is not approved? Letters of commitment from the Chancellor and/or Chief Academic Officer should be provided.

10. For doctoral programs only: Response: Not Applicable.

- a. Describe the research and scholarly infrastructure in place (including faculty) to support the proposed program.
- b. Describe the method of financing the proposed new program (including extramural research funding and other sources) and indicate the extent to which additional state funding may be required.
- c. State the number, amount, and source of proposed graduate student stipends and related tuition benefits that will be required to initiate the program.

11. Contact. List the names, titles, e-mail addresses and telephone numbers of the person(s) responsible for planning the proposed program.

Donald Lysle, Ph.D., Kenan Distinguished Professor and Chair, Department of Psychology and Neuroscience, dlysle@email.unc.edu, (919) 962-3088

Regina Carelli, Ph.D., Baxter Distinguished Professor and Co-Associate Chair, Department of Psychology and Neuroscience, rcarelli@email.unc.edu, (919) 962-9785

Beth Kurtz-Costes, Ph.D., Zachary Taylor Smith Distinguished Term Professor and Director of Undergraduate Studies, Department of Psychology and Neuroscience, bkcostes@email.unc.edu, (919) 962-4137

Kelly Giovanello, Ph.D., Professor and Director UNC-CH Neuroscience Minor, Department of Psychology and Neuroscience, kgio@unc.edu, 919-843-1302

This request for authorization to plan a new program has been reviewed and approved by the appropriate campus committees and authorities.

Chancellor: _____

Date: _____

Chancellor (Joint Partner Campus): _____

Date: _____

SAMPLE PLAN: Neuroscience Major (B.S.)

| First Year (fall) | Hrs | First Year (spring) | Hrs |
|---------------------------------------|-----|------------------------------------|-----|
| ENGL 105 (CR) | 3 | Foreign language level 3 (FL) | 3 |
| BIOL 101/101L (PX) | 4 | Approaches ² (e.g., VP) | 3 |
| MATH 231 (QR) | 4 | MATH 232 (QI) | 4 |
| Foreign Language level 2 (FL) | 3 | PSYC 101 (PL) | 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 |
| PSYC 105/315 (PL) | 3 | COMP 116 (QR) | 3 |
| STOR 155 or PSYC 210 (QR/QI) | 3 | BIOL 202 | 4 |
| Approaches ² (e.g., SS/HS) | 3 | CHEM 241/241L | 4 |
| Elective | 3 | Elective | 3 |
| subtotal: 16 | | subtotal: 17 | |
| Junior Year (fall) | Hrs | Junior Year (spring) | Hrs |
| PSYC 270 (PX, EE) ¹ | 4 | PHYS 115 | 4 |
| PHYS 114 | 4 | BIOL 205 | 4 |
| CHEM 261 | 3 | CHEM 262/262L | 4 |
| Group 1, course #1 | 3 | Approaches ² (e.g., LA) | 3 |
| | | Elective | 1 |
| subtotal: 14 | | subtotal: 16 | |
| 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 |
| subtotal: 12 | | subtotal: 13 | |
| | | 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

Neuroscience Major Proposal

The interdisciplinary neuroscience major consists of courses across ten departments: Biology, Biomedical Engineering, Biostatistics, Chemistry, Computer Science, Mathematics, Exercise and Sports Science, Physics, Psychology and Neuroscience, and Statistics and Operations Research. The neuroscience major is open to all students. However, students should note that they are limited to no more than 45 credit hours within a specific department. Finally, all students will be encouraged to participate both in independent research, as well as honors research in neuroscience with faculty in any department.

Psychology and Neuroscience

Introduction to Neuroscience (**PSYC 315 - renumber to PSYC 105**)

PSYC 210 Statistics OR STOR 155 Introduction to Data Models and Inference

PSYC 270 OR BIOL 211 Research Methods

PSYC 222 Learning

PSYC 225 Sensation and Perception

Biology

BIOL 101 Introduction to Biology

BIOL 101 L Introduction to Biology Lab

BIOL 202 Molecular Biology and Genetics

BIOL 205 Cellular and Developmental Biology

Chemistry

CHEM 101 General Descriptive Chemistry I

CHEM 102 General Descriptive Chemistry II

CHEM 241 Modern Analytical Methods for Separation and Characterization

CHEM 241L Modern Analytical Methods for Separation and Characterization Lab

CHEM 261 Introduction to Organic I

CHEM 262 Introduction to Organic II

CHEM 101L General Descriptive Chemistry I Lab

CHEM 102L General Descriptive Chemistry II Lab

CHEM 262L Introduction to Organic II

Computer Science

COMP 116 Introduction to scientific programming

Math

MATH 231 Calculus I

MATH 232 Calculus II

Physics

PHYS 114 General Physics 1 for students of life sciences

PHYS 115 General Physics 2 for students of the life sciences

STOR

STOR 155 Introduction to Data Models and Inference **OR** PSYC 210

Elective Courses

Group 1 = Knowledge-Base (Students will Choose 2)

Psychology and Neuroscience

PSYC 220 Biopsychology
PSYC 245 Abnormal Psychology
PSYC 320 Drugs and Human Behavior
PSYC 401 Animal Behavior
PSYC 404 Clinical Psychopharmacology
PSYC 415 History of Neuroscience
PSYC 420 Functional Neuroanatomy
PSYC 424 Neural Connections Hands On Neuroscience
PSYC 425 Advanced Perceptual processes
PSYC 426 Molecular Mechanisms of Memory
PSYC 427 Neurobiology of Aging
PSYC 428 Neuroscience Society and the Media
PSYC 429 Neuroeconomics and the Science of Consequence
PSYC 434 Cognitive Neuroscience
PSYC 437 Neurobiology of Learning and Memory
PSYC 469 Evolution and Development of Biobehavioral Systems
PSYC 507 Autism
PSYC 568 Emotion
PSYC 602 Evolutional Psychology

Biology

BIOL 352 Human Anatomy and Physiology I
BIOL 352L Human Anatomy and Physiology I
BIOL 425 Human Genetics
BIOL 450 Intro to Neurobiology
BIOL 455 Behavioral Neuroscience (OR Biopsychology PSYC 220)
BIOL 458 Sensory Neurobiology and Behavior
BIOL 552 Behavioral Endocrinology
BIOL 542 Light Microscopy for the biological sciences
BIOL 553 Mathematical and Computational Models in Biology (MATH 564)

Chemistry

CHEM 430 Introduction to Biological Chemistry

Computer Science

COMP 401 Foundations of Data Programming
COMP 410 Data Structures
COMP 411 Computer Organization
COMP 555 Bioalgorithms
COMP 560 Artificial Intelligence

COMP 562 Introduction to Machine Learning
COMP 576 Mathematics for Image Computing
COMP 581 Introduction to Robotics
COMP 631 Computer Networks
COMP 633 Parallel and Distributed Computing
COMP 651 Computation Geometry
COMP 665 Images, Graphics, and Vision

Exercise and Sports Science (Met with Chair; core and elective courses confirmed)

EXSS 175 Human Anatomy (OR BIOL 352)
EXSS 275L Human Anatomy Lab
EXSS 276 Human Physiology
EXSS 380 Neuromuscular Control and Learning

Physics

PHYS 133 How bio works?
PHYS 405 Biological Physics

Group 2 = Mathematics, Methods, and Statistics (Students will Choose 2)

Psychology and Neuroscience

PSYC 402 Advanced Biopsychology
PSYC 403 Advanced Biopsychology Lab
PSYC 533 General Linear Model

Biology

BIOL 226 Mathematical Methods for Quantitative Biology
BIOL 226L Mathematical Methods for Quantitative Biology Lab

Biostatistics (Met with Chair; core and elective courses confirmed)

BIOS 500H Intro to Biostatistics
BIOS 610 Biostatistics for laboratory scientists

Biomedical Engineering (Met with Chair; core and elective courses confirmed)

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

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
MATH 662 Scientific Computation II
MATH 668 Methods of Applied Mathematics I
MATH 669 Methods of Applied Mathematics II

STOR

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

Neuroscience Major Proposal

List of Faculty Mentors (by Department) for Undergraduate Independent Neuroscience Research and Honors Thesis Research.

Psychology and Neuroscience

Charlotte Boettiger, Ph.D,
Regina Carelli, Ph.D.
Carol Cheatham, Ph.D.
Jessica Cohen, Ph.D.
Stacey Daughters, Ph.D.
Sylvia Fitting, Ph.D.
Kathleen Gates, Ph.D.
Kelly Giovanello, Ph.D.
Mark Hollins, Ph.D.
Joseph Hopfinger, Ph.D.
Kristen Lindquist, Ph.D.
Donald Lysle, Ph.D.
Keely Muscatell, Ph.D.
Montserrat Navarro, Ph.D.
David Penn, Ph.D.
Kathryn Reissner, Ph.D.
Margaret Sheridan, Ph.D.
Eva Telzer, Ph.D.
Todd Thiele, Ph.D.

Biology

Sabrina Burmeister, Ph.D.
Stephen Crews, Ph.D.
Ken Lohmann, Ph.D.
Celia Shiau, Ph.D.
Keith Sockman, Ph.D.

Biomedical Engineering

Paul Dayton, Ph.D.
Jason Franz, Ph.D.
Caterina Gallippi, Ph.D.
Shawn Gomez, Ph.D.
Xiaogang Hu, Ph.D.
Helen Huang, Ph.D.
David Lalush, Ph.D.
Gianmarco Pinton, Ph.D.

Chemistry

Jeffrey Dick, Ph.D.

Computer Science

Ron Alterovitz, Ph.D.

Mohit Bansal, Ph.D.

Tamara Berg, Ph.D.

Mark Niethammer, Ph.D.

Shahriar Nirjon, Ph.D.

Stephen Pizer, Ph.D.

Jan Prins, Ph.D.

Martin Styner, Ph.D.

Exercise and Sports Science

Troy Blackburn, Ph.D.

Jason Mihalik, Ph.D.

Johna Register-Mihalik, Ph.D.

Brian Pietrosimone, Ph.D.

Erik Wistrom, Ph.D.

Math

Katie Newhall, Ph.D.

Physics

Tamara Branca, Ph.D,

Amy Oldenburg, Ph.D.

Statistics and Operations Research

Yufeng Liu, Ph.D.

Andrew Nobel, Ph.D.

Vladas Pipiras, Ph.D.

Yin Xia, Ph.D.

March 8, 2017

Donald T. Lysle, Ph.D.
Kenan Distinguished Professor
Chair, Department of Psychology and Neuroscience
University of North Carolina Chapel Hill

Dear Don,

It was a pleasure meeting with you and your colleagues regarding the initiative to establish a new undergraduate major in neuroscience. As we discussed, neuroscience is a highly interdisciplinary field, encompassing many of the core scientific disciplines including psychology, biology, physics, chemistry, exercise and sports science and computer science. Additionally, students must be well-versed in mathematics and statistics. As such, students interested in pursuing the study of neuroscience will, by necessity, require coursework across several academic departments. I am pleased that the Chairs of these departments within the Natural Science division have given their full support to the establishment of the major as expressed in the letters of support.


Based on the presentation and ensuing discussion during our meeting, as well as your collection of additional information on neuroscience majors at specific institutions, I support your proposal that the Neuroscience major should be intellectually co-sponsored by all signatory departments within the College of Arts and Sciences. Additionally, I endorse your plan to establish an executive advisory committee that will make broad and substantial intellectual contributions to the design of the major, including required courses and curriculum development. This executive advisory committee will be composed of a single representative from each of the 10 signatory departments. The introductory-level course for this major should be very broad in scope; any substitutions for the current course should be considered by the executive advisory committee. Furthermore, there are a substantial number of courses that currently are offered in Departments to support a neuroscience major. In light of this, I support the development and co-teaching of new courses between multiple CAS departments.

Finally, the Department of Psychology and Neuroscience should be the single administrative home of the neuroscience major, as it has not only sponsored and cultivated undergraduate neuroscience education for more 9 years (e.g., founding of the Carolina Neuroscience Club, launching and administration of the undergraduate neuroscience minor, and initiating the Request to Plan for a new major), but has worked to move this process along to completion. Moreover, nearly half of the neuroscience faculty within CAS (N=19) reside within

the Department of Psychology and Neuroscience. I am looking forward to working with you to make this new interdisciplinary major a success and reflective of the broad array of undergraduate student interests in the field of neuroscience.

In closing, I enthusiastically support your proposal of this new, highly interdisciplinary major in the field of neuroscience.

Best wishes,



J. Christopher Clemens

Senior Associate Dean for Natural Sciences

Jaroslav Folda Distinguished Professor of Physics and Astronomy



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THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

DEPARTMENT OF COMPUTER SCIENCE
116 FREDERICK P. BROOKS, JR. BUILDING
CAMPUS BOX 3175
CHAPEL HILL, NC 27599-3175

T 919.590.6238
F 919.590.6238
<http://jeffay.web.unc.edu>
jeffay@cs.unc.edu

KEVIN JEFFAY
Gillian Cell Distinguished Professor and Chair

February 9, 2017

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

Dear Don,

It was a pleasure meeting with you and your colleagues regarding the initiative to establish a new undergraduate major in neuroscience. As we discussed, neuroscience is a highly interdisciplinary field, encompassing many of the core scientific disciplines including psychology, biology, physics, chemistry, computer science, and mathematics. Additionally, students must be well versed in statistics. As such, students interested in pursuing the study of neuroscience will, by necessity, require coursework across several academic departments.

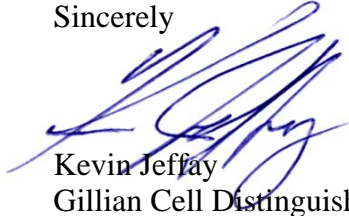
For the proposed neuroscience major, I understand that all students will enroll in an Introduction to Neuroscience course, and thereafter be required to successfully complete additional core and elective courses. The specific course in my unit (Computer Science) that may serve as core course for the neuroscience major is COMP 116 (Introduction to Scientific Programming). Additionally, the following courses may serve as electives for the neuroscience major:

- COMP 401 (Foundations of Data Programming),
- COMP 410 (Data Structures),
- COMP 411 (Computer Organization),
- COMP 555 (Bioalgorithms),
- COMP 560 (Artificial Intelligence),
- COMP 562 (Introduction to Machine Learning),
- COMP 576 (Mathematics for Image Computing),
- COMP 581 (Introduction to Robotics),
- COMP 631 (Computer Networks),
- COMP 633 (Parallel and Distributed Computing),
- COMP 651 (Computational Geometry), and
- COMP 655 (Images, Graphics, and Vision).

In addition, students interested in pursuing independent research, as well as honors research in neuroscience may do so with faculty within my department. More specifically, Drs. Ron Alterovitz, Mohit Bansal, Alex Berg, Tamara Berg, Mark Niethammer, Shahriar Nirjon, Stephen Pizer, Jan Prins, and Martin Styner are interested in working with undergraduates on research topics related to neuroscience.

In closing, I enthusiastically support the proposal of this new, highly interdisciplinary major. Please let me know if I can do anything further to support the proposal.

Sincerely



Kevin Jeffay
Gillian Cell Distinguished Professor and Chair



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THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

DEPARTMENT OF CHEMISTRY

CAMPUS BOX 3290 T 919.966.4575
CHAPEL HILL, NC 27599-3290 O 919.962.4358
www.chem.unc.edu F 919.962.2388
jsj@unc.edu

JEFFREY S. JOHNSON

A. Ronald Gallant Distinguished Professor and Department Chair

February 9, 2017

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

Dear Don,

It was a pleasure meeting with you and your colleagues yesterday afternoon regarding the initiative to establish a new undergraduate major in neuroscience. As we discussed, neuroscience is a highly interdisciplinary field, encompassing many of the core scientific disciplines including psychology, biology, physics, chemistry, computer science, and mathematics. Additionally, students must be well versed in statistics. As such, students interested in pursuing the study of neuroscience will, by necessity, require coursework across several academic departments.

For the proposed neuroscience major, I understand that all students will enroll in an Introduction to Neuroscience course, and thereafter be required to successfully complete additional core and elective courses. The specific courses in my unit (Chemistry) that may serve as core courses for the neuroscience major are CHEM 101 (General Descriptive Chemistry I), CHEM 101L (General Descriptive Chemistry I Lab), CHEM 102 (General Descriptive Chemistry II), CHEM 102L (General Descriptive Chemistry Lab II), CHEM 261 (Introduction to Organic Chemistry I), CHEM 262 (Introduction to Organic Chemistry II), CHEM 262L (Introduction to Organic Chemistry II Lab). Additionally, CHEM 430 (Introduction to Biological Chemistry) may serve as an elective course for the neuroscience major. Finally, students interested in pursuing independent research, as well as honors research in neuroscience may do so with faculty within my department. More specifically, Prof. Jeffrey Dick (arrival: July 2018) may be interested in working with undergraduates on research topics related to neuroscience.

In closing, I enthusiastically support the proposal of this new, highly interdisciplinary major. Please let me know if I can do anything further to support the proposal.

Sincerely,

A handwritten signature in black ink, reading "Jeffrey S. Johnson" with a long horizontal flourish extending to the right.

Jeffrey S. Johnson

A. Ronald Gallant
Distinguished Professor

Department Chairperson



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

DEPARTMENT OF BIOLOGY
COKER HALL
CAMPUS BOX 3280
CHAPEL HILL, NC 27599-3280

T 919.962.2077
F 919.962.1625
biology.unc.edu

April 10, 2017

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

Dear Don,

It was productive to meet recently regarding the initiative to establish a new undergraduate major in neuroscience, and I thank you and your department for initiating this important effort - you and your team have put significant time and energy into the process. Neuroscience is a highly interdisciplinary field, encompassing many of the core scientific disciplines including psychology, biology, physics, chemistry, computer science, and mathematics. Additionally, students must be well versed in statistics. As such, this major will benefit from input from the proposed executive committee composed of a member from all of the relevant CAS departments. It is our understanding that this committee will be convened in a timely manner, be an integral part of the planning process for the new interdisciplinary major, and that it will have a decision-making role in defining the curriculum.


For the proposed neuroscience major, I understand that all students will enroll in an Introduction to Neuroscience course, and thereafter be required to successfully complete additional core and elective courses. The relevant faculty in Biology also believe that a second required course that is non-overlapping with the Intro to Neuroscience course called Introduction to Neurobiology (BIOL 450), should be part of the curriculum and we look forward to discussing this proposal with the executive committee. As we discussed, we are willing to work with your department to ensure that this requirement provides significant new material not found in the Intro to Neuroscience course and important for the students to be competitive for graduate and medical programs.

Other specific courses in our unit (Biology) that may serve as core courses for the neuroscience major are BIOL 101 (Introduction to Biology), BIOL 101L (Introduction to Biology Lab), BIOL 202 (Molecular Biology and Genetics), and BIOL 205 (Cellular and Developmental Biology). Additionally, the following courses may serve as electives for the neuroscience major: BIOL 226 (Mathematical Methods for Quantitative Biology), BIOL 226L (Mathematical Methods for Quantitative Biology Lab), BIOL 352 (Human Anatomy and Physiology I), BIOL 352L (Human Anatomy and Physiology I Lab), BIOL 425 (Human Genetics), BIOL 455 (Behavioral Neuroscience), BIOL 458 (Sensory Neurobiology and Behavior), BIOL 542 (Light Microscopy for the Biological Sciences), BIOL 552 (Behavioral Endocrinology), and BIOL 553 (Mathematical and Computational Models in Biology). Finally, students interested in pursuing independent research, as well as honors research in neuroscience can do so under faculty within my department. Several faculty, including Drs. Sabrina Burmeister, Stephen Crews, Ken Lohmann,

Celia Shiau and Keith Sockman are interested in working with undergraduates on research topics related to neuroscience. Additionally, numerous other faculty are working on research questions in neuroscience or relevant to the field such as Drs. Victoria Bautch, Mark Peifer, and Stephen Rogers. Finally, we are in the final stages of recruiting two new faculty whose research fits very well with the new interdisciplinary neuroscience major - Dr. Brian Taylor who has a background in engineering and computational neuroscience and is focused on bio-inspired engineering, and Dr. Toshi Hige, who is using state-of-the-art genetic and imaging tools to map neural circuits from input through the CNS to the output, in *Drosophila*. We also anticipate further hires in neurobiology/neuroscience in the coming years. Thus Biology is well-placed to support the efforts of the interdisciplinary neuroscience major.

In closing, the Biology Department supports the proposal of this new, highly interdisciplinary major and thanks you and your team for the great job you've done to start the process. Our team looks forward to working with your team and other stakeholders as we put together this exciting and timely new major.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Victoria Bautch", with a stylized flourish at the end.

Victoria L Bautch, PhD

Beverly Long Chapin Distinguished Professor and Chair of Biology



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THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

DEPARTMENT OF BIostatISTICS

CAMPUS BOX 7420
CHAPEL HILL, NC 27599-7420

T 919.966.7250
F 919.966.3804
www.sph.unc.edu/bios

February 21, 2017

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

JIANWEN CAI, PhD
Interim Chair

AMY H. HERRING, SCD
Interim Vice Chair

Dear Dr. Lysle,

It was a pleasure meeting with you and your colleagues regarding the initiative to establish a new undergraduate major in neuroscience. As we discussed, neuroscience is a highly interdisciplinary field, encompassing many of the core scientific disciplines including psychology, biology, physics, chemistry, computer science, and mathematics. Additionally, students must be well versed in statistics. As such, students interested in pursuing the study of neuroscience will, by necessity, require coursework across several academic departments.

For the proposed neuroscience major, I understand that all students will enroll in an Introduction to Neuroscience course, and thereafter be required to successfully complete additional core and elective courses. The specific courses in my unit (Biostatistics) that may serve as elective courses for the neuroscience major are BIOS 500H (Introduction to Biostatistics), BIOS 600 (Principles of Statistical Inference), and BIOS 610 (Biostatistics for Laboratory Scientists). Additionally, students interested in pursuing independent research, as well as honors research in neuroscience may do so with faculty within my department. More specifically, Professors Ibrahim and Zeng are interested in working with undergraduates on research topics related to neuroscience.

In closing, I enthusiastically support the proposal of this new, highly interdisciplinary major. Please let me know if I can do anything further to support the proposal.

Best wishes,

Jianwen Cai, PhD
Cary C. Boshamer Distinguished Professor and
Interim Chair of Biostatistics



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

Joint Department of
Biomedical Engineering

NC STATE
UNIVERSITY

152 MacNider Hall, Chapel Hill, NC 27599-7575
(919) 966-1175; (919) 966-2963 fax
<http://www.bme.unc.edu>

4130 Engineering Building III, Raleigh, NC 27695-7115
(919) 515-5252; (919) 513-3814 fax
<http://www.bme.ncsu.edu>

February 9, 2017

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

Dear Don,

It was a pleasure meeting with you and your colleagues regarding the initiative to establish a new undergraduate major in neuroscience. As we discussed, neuroscience is a highly interdisciplinary field, encompassing many of the core scientific disciplines including psychology, biology, physics, chemistry, computer science, and mathematics. Additionally, students must be well versed in statistics. As such, students interested in pursuing the study of neuroscience will, by necessity, require coursework across several academic departments.

For the proposed neuroscience major, I understand that all students will enroll in an Introduction to Neuroscience course, and thereafter be required to successfully complete additional core and elective courses. Given the requirements of the Joint UNC-NC State Biomedical Engineering undergraduate program, only students admitted to the BME degree program may additionally take courses in BME toward the neuroscience major. These courses include the following elective: 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), and BMME 550 (Medical Imaging: Ultrasonic, Optical and MR Systems). Additionally, students interested in pursuing independent research, as well as honors research in neuroscience may do so with faculty within my department. More specifically, Paul Dayton, Jason Franz, Caterina Gallippi, Shawn Gomez, Xiaogang Hu, Helen Huang, David Lalush, and Gianmarco Pinton are interested in working with undergraduates on research topics related to neuroscience.

I should note that our department is planning to offer additional courses during the summer sessions, in which case undergraduates not enrolled in the BMME program could enroll in BMME courses for electives toward the neuroscience major.

In closing, I enthusiastically support the proposal of this new, highly interdisciplinary major. Please let me know if I can do anything further to support the proposal.

Best wishes,

Nancy Allbritton, M.D., Ph.D.
Kenan Professor & Chair, Joint Department of Biomedical Engineering



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of NORTH CAROLINA
at CHAPEL HILL

DEPARTMENT OF EXERCISE AND SPORT SCIENCE

CAMPUS BOX 8700
CHAPEL HILL, NC 27599-8700

February 9, 2017

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

Dear Don,

It was a pleasure meeting with you and your colleagues regarding the initiative to establish a new undergraduate major in neuroscience. As we discussed, neuroscience is a highly interdisciplinary field, encompassing many of the core scientific disciplines including psychology, biology, physics, chemistry, computer science, and mathematics. Additionally, students must be well versed in statistics. As such, students interested in pursuing the study of neuroscience will, by necessity, require coursework across several academic departments.

For the proposed neuroscience major, I understand that all students will enroll in an Introduction to Neuroscience course, and thereafter be required to successfully complete additional core and elective courses. The specific courses in my unit (Exercise and Sports Science) that may serve as elective courses for the neuroscience major are EXSS 175 (Human Anatomy), EXSS 275L (Human Anatomy Lab), EXSS 276 (Human Physiology), and EXSS 380 (Neuromuscular Control and Learning). Additionally, students interested in pursuing independent research, as well as honors research in neuroscience may do so with faculty within my department. More specifically, Drs. Troy Blackburn, Jason Mihalik, Johna Register-Mihalik, Brian Pietrosimone, and Erik Wistrom are interested in working with undergraduates on research topics related to neuroscience.

In closing, I enthusiastically support the proposal of this new, highly interdisciplinary major. Please let me know if I can do anything further to support the proposal.

Best wishes,

Darin Padua, Ph.D.
Professor and Chair, Department of Exercise and Sports Science



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

College of Arts and Sciences
rmm@email.unc.edu

Richard M. McLaughlin
Chairman

DEPARTMENT OF MATHEMATICS

329 PHILLIPS HALL

P 919-962-1294

CAMPUS BOX 3250
CHAPEL HILL, NC 27599-3250
www.math.unc.edu

F 919-962-2568

January 4, 2017

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

Dear Don,

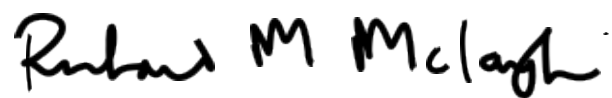
I write in response to our meeting this afternoon regarding the proposal of a new undergraduate major in Neuroscience. As we discussed, neuroscience is a highly interdisciplinary field, encompassing many of the core scientific disciplines including psychology, biology, physics, chemistry, computer science, and mathematics. As such, students interested in pursuing the study of neuroscience will, by necessity, require coursework across several academic departments.

For the proposed neuroscience major, I understand that all students will enroll in an Introduction to Neuroscience course, and thereafter be required to successfully complete additional core and elective courses. The specific courses in my unit (Mathematics) that may serve as core courses for the neuroscience major are MATH 231 (Calculus I) and MATH 232 (Calculus II). Additionally, the following courses may serve as elective courses for the neuroscience major: MATH 241 (Biocalculus I), MATH 283 (Biocalculus II), MATH383 (First Course in Differential Equations), MATH383L (First Course in Differential Equations laboratory), MATH 406 (Mathematical Methods for 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), MATH 566 (Introduction to Numerical Analysis), MATH 577 (Linear Algebra), MATH 661 (Scientific Computation I), MATH 662 (Scientific Computation II), MATH 668 (Methods of Applied Mathematics I), and MATH 669 (Methods of Applied Mathematics II). I agree to allow students with a declared major in neuroscience to enroll in these courses. Finally, students interested in pursuing independent research, as well as honors research in neuroscience may do so with faculty within my department.

In closing, I enthusiastically support the proposal of this new, highly interdisciplinary major. Please let me know if I can do anything further to support the proposal.

Best wishes,

Richard M. McLaughlin, Ph.D.
Professor and Chair, Department of Mathematics

A handwritten signature in black ink that reads "Richard M. McLaughlin". The signature is written in a cursive style, with the first name "Richard" being more legible than the middle initial "M" and the last name "McLaughlin".



January 18, 2017

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

Dear Don,

I write in response to our meeting regarding the proposal of a new undergraduate major in Neuroscience. As we discussed, neuroscience is a highly interdisciplinary field, encompassing many of the core scientific disciplines including psychology, biology, physics, chemistry, computer science, and mathematics. As such, students interested in pursuing the study of neuroscience will, by necessity, require coursework across several academic departments.

For the proposed neuroscience major, I understand that all students will enroll in an Introduction to Neuroscience course, and thereafter be required to successfully complete additional core and elective courses. The specific courses in my unit (Physics) that may serve as core courses for the neuroscience major are PHYS 114 (General Physics I) and PHYS 115 (General Physics II). Additionally, the following courses may serve as electives for the neuroscience major: PHYS 113 (How Bio works?) and PHYS 405 (Biological Physics). I agree to allow students with a declared major in neuroscience to enroll in these courses. Finally, students interested in pursuing independent research, as well as honors research in neuroscience may do so with faculty within my department. In particular, Drs. Tamara Branca and Amy Oldenburg would be excellent potential mentors for a student interested in physics concepts related to the field of neuroscience.

In closing, I enthusiastically support the proposal of this new, highly interdisciplinary major. Please let me know if I can do anything further to support the proposal.

Best wishes,

Christian Iliadis, Ph.D.
Professor and Chair, Department of Physics and Astronomy



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

DEPARTMENT OF STATISTICS
AND OPERATIONS RESEARCH

320 HANES HALL
CAMPUS BOX 3260
CHAPEL HILL, NC 27599-3260

T 919.962.2189
F 919.962.1329
budhiraj@email.unc.edu

January 18, 2017

AMARJIT BUDHIRAJA
Professor & Chairman

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

Dear Don,

It was a pleasure meeting with you and your colleagues this afternoon regarding the initiative to establish a new undergraduate major in neuroscience. As we discussed, neuroscience is a highly interdisciplinary field, encompassing many of the core scientific disciplines including psychology, biology, physics, chemistry, computer science, and mathematics. Additionally, students must be well versed in statistics. As such, students interested in pursuing the study of neuroscience will, by necessity, require coursework across several academic departments.

For the proposed neuroscience major, I understand that all students will enroll in an Introduction to Neuroscience course, and thereafter be required to successfully complete additional core and elective courses. The specific course in my unit (Statistics and Operations Research) that may serve as a core course for the neuroscience major is STOR 155 (Introduction to Data Models and Inference). Additionally, the following courses may serve as elective courses for the neuroscience major: 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), and STOR 565 (Machine Learning). Finally, students interested in pursuing independent research, as well as honors research in neuroscience may do so with faculty within my department. More specifically, there are several faculty in my department who are interested in working with undergraduates on research topics related to neuroscience, including Professors Shankar Bhamidi, Vladas Pipiras and Kai Zhang.

In closing, I enthusiastically support the proposal of this new, highly interdisciplinary major. Please let me know if I can do anything further to support the proposal.

Best wishes,

Amarjit Budhiraja
Professor and Chair
Statistics and Operations Research Department

April 13, 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 Plan 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 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.