Drexel University College of Medicine
Neuroscience Graduate Program (PhD & MD/PhD)

POLICIES AND PROCEDURES
2016-2017

Peter W. Baas, PhD
Professor of Neurobiology and Anatomy
Director, Graduate Program in Neuroscience
Drexel University College of Medicine
2900 Queen Lane
Philadelphia, PA 19129
Telephone: (215) 991-8298
Fax: (215) 843-9082
Email: pbaas@drexelmed.edu

Ramesh Raghupathi, PhD
Professor of Neurobiology and Anatomy
Deputy Director, Graduate Program in Neuroscience
Drexel University College of Medicine
2900 Queen Lane
Philadelphia, PA 19129
Telephone: (215) 991-8405
Fax: (215) 843-9082
Email: rramesh@drexelmed.edu

PROGRAM OF STUDY FOR Ph.D. IN NEUROSCIENCE

A. Course Requirements

The curriculum includes two semesters of a "Core Curriculum" that is shared by all of the biomedical graduate programs and a series of programmatic courses specific for neuroscience students. All students in the Neuroscience Program must take the Core Curriculum (except for M.D./Ph.D. students) and Scientific Integrity and Ethics as well as the programmatic courses. All students must participate in a seminar/discussion course (Journal Club -Neurobiology Topics), starting in their second year and during every semester while in the program, prior to registering for Thesis Defense Only (see Section G). Total number of research credits is variable for each student and will include the completion of an acceptable and publishable research project at the doctoral level. The Neuroscience Steering Committee will advise each student on the selection of the flexible aspects of the curriculum.

B. Curriculum

First Year Fall Semester	
Core Curriculum I	5
Graduate Neuroscience I	2.5
1st Lab Rotation	4
Total Credits:	**11.5**
First Year Spring Semester	
Core Curriculum II	5
Medical Neuroscience	6
2nd Lab Rotation	4
Total Credits:	**15**
Second Year Fall Semester	
Neuroscience 3rd Lab Rotation (summer)(optional)	4
Graduate Neuroscience II	5
Neuroscience Thesis Research	9
Current Topics in Neurobiology (Journal Club)	2
Scientific Integrity and Ethics	2
Total Credits:	**18-22**
Second Year Spring Semester	
One of the following Advanced Neuroscience courses	
Cellular and Developmental Neuroscience	1
Systems and Behavioral Neuroscience	1
Motor Systems	4
Neuroscience Thesis Research	9
Statistics for Neuro/Pharm Research	2
Current Topics in Neurobiology (Journal Club)	2
*Elective	Variable credits
Total Credits:	**14-18**

Third Year Semesters and Beyond	
Current Topics in Neurobiology (Journal Club)	2
Neuroscience Thesis Research or Thesis Defense	9
Total Credits:	**11**

* Electives can be taken at the discretion and advice of the student's mentor and the Program Director. The possibility exists for students to choose from a variety of courses as an elective. For example, students can take a neuropharmacology class (for Behavioral Neurobiology students) or a programming class (for Neuroengineering students). Decisions on the elective appropriate for each student will be made by the Neuroscience Steering Committee.

The Office of Biomedical Education has established criteria by which all students in all graduate programs will be uniformly evaluated regarding the Core Curriculum. Students must achieve a score of 80 in each semester of the Core in order to pass, and must achieve an overall average of 80 for both semesters of the Core in order to maintain stipend funding. Failed courses must be repeated. Funding revoked due to failure of the Core can resume upon re-establishing good standing, although the funds withheld will not be restored to the student. Regarding the Programmatic courses, a grade of B must be earned in each course. Programmatic courses must be repeated if the student earns a grade below a B in that particular course. Programmatic courses in which a student has earned a grade of B- can be remediated to a B. Students who fail more than one course or earn more than one grade below a B will be dismissed from the program at the discretion of the Neuroscience Steering Committee.

Unsatisfactory Performance in Journal Clubs
Three unexcused absences are allowed per year for journal clubs. More than three absences will result in a grade of Unsatisfactory (U). The "U" must be remediated to the satisfaction of the course director. Failure to remediate is grounds for dismissal from the program.

Laboratory Rotations
There are three rotations in the curriculum for which the doctoral student will be assigned a Pass/Fail grade. Each rotation is one semester in length. The purpose of these rotations is to enable the student to be matched with the most appropriate Graduate Advisor to supervise the student. The Neuroscience Program Director and the Steering Committee will advise each student on the selection of rotations, as well as on the progress and outcome of rotations. Students have the option of arriving early to either complete an entire rotation or a partial rotation in the preceding summer semester. Once a rotation is underway, the student and faculty member must both stay in contact with the Program Director so that any problems that arise can be addressed, and especially if the rotation is proving to be unproductive. Flexibility will be afforded in certain situations in which the PhD student may be able to select an advisor before completing all three rotations, or in situations wherein it is advisable to terminate a particular rotation early in favor of another choice. **Students may NOT finalize rotations without instruction and guidance from the Program Director.** Any student who is unable to identify a mentor willing to take him or her before the start of the second year will not be able to continue in the program. Please refer to Appendix #1 for a detailed description of the policies and requirements for Laboratory Rotations

Laboratory rotations are graded on a Satisfactory (S) or Unsatisfactory (U) basis. Students receiving an "S" are rated on a performance scale ranging from Outstanding (1) to Poor (5). A "U" for a lab rotation

is reserved for students that do not meet performance requirements, including attendance, of the rotation as stipulated by the program. A "U" for a laboratory rotation is grounds for dismissal from the program.

M.D./Ph.D. students

Due to their two years of medical school preparation prior to the start of their graduate training, students in the combined program are excused from the Core Curriculum, Graduate Neuroscience I, and Medical Neuroscience. Due to the time restrictions on their course of study, they must complete all course requirements during their first year of graduate training. Typically, an MD/PhD student will have selected a thesis laboratory by the start of their graduate training, but if not, the student must do so by the end of the first semester of graduate training. Therefore, the three-rotation requirement is waived, and MD/PhD students must register for Thesis Research starting in their first Fall semester. They are required to take Graduate Neuroscience II and Scientific Integrity and Ethics in the Fall semester and, Statistics for Neuroscience/Pharmacology Research, and one of the Neuroscience Specialized courses in the Spring semester. In addition, they may choose to take Principles of Neuropharmacology after consultation with their major advisor and Program Director. All MD/PhD students must register for Journal Club (Neurobiology Topics) every semester beginning in their first semester of graduate training until they register for Thesis Defense Only (see Section G). MD/PhD students are exempt from taking the Preliminary Exam but must take the Qualifying Examination before the end of their first year of graduate training.

Neuroengineering Students

Drexel University has a neuroengineering focus served by two PhD programs: Biomedical Engineering (in the School of Biomedical Engineering and Health Science); and Neuroscience (in the College of Medicine). Doctoral Students with a focus on neuroengineering who matriculate within the Graduate Program in Neuroscience in the College of Medicine are held to every rule and detail outlined in the present document. However, it is also understood that these students may need more flexibility in the Curriculum, such as taking additional courses offered outside of the College of Medicine as well as at least one different question on the Preliminary Exam. In terms of rotations and the final choice of mentor, neuroengineering students within the Graduate Program in Neuroscience are required to select faculty members within the College of Medicine, although exceptions can be made. Neuroengineering students will be under the supervision of the Director of the Neuroscience program, the Director of the Neuroengineering program and Steering Committee of the Graduate Program in Neuroscience.

C. Preliminary Exam

1. The Preliminary Exam is a requirement of the Biomedical Graduate Education Committee. The Preliminary Examination for the Neuroscience Program, which will be overseen by a Chair appointed by the Steering Committee of the program, will be given in early January of the second year, shortly after the completion of the Graduate Neuroscience II course. The exam will consist of written and oral components based on a broad knowledge of Cellular and Developmental Neuroscience, Neuroanatomy, Behavioral Neuroscience, and Systems Neuroscience. The subject matter may be adjusted in one of these areas to accommodate students with a neuroengineering focus. The written component will be a take-home, open-book format, wherein the students will have a week to turn in their answers. The oral component will follow within 7 days after the written exams are turned in, and questions will be based on the written answers provided by the student.
2. The Preliminary Exam will be administered by a committee of faculty members who are involved in the instruction of the programmatic courses. The questions will cover general concepts as well as specific information.
3. A grade of pass or fail will be assigned. If the student fails, he or she must repeat and pass the

exam within two months (60 days) of failing. If the student fails a second time, he or she will be dismissed from the program. Students passing but performing poorly on certain aspects of the test may be asked to remediate those particular aspects of the test.

4. There will be a programmatic "memory" of the performance of the student that will be carried forward, so that repeated demonstration of the same weaknesses in the Qualifying Exam and Thesis Proposal may be grounds for dismissal from the program.

D. Qualifying Exam

1. The Qualifying Exam is a requirement of the Biomedical Graduate Education Committee and will include both written and oral components.

2. Students will take the Qualifying Exam by the end of the spring of the second year. Examination dates will be set by the Steering Committee.

3. Each student is required to write a research grant application. The total length of the document must not exceed 12 pages (not including references), single-spaced, half-inch margins, 11-point arial font. The format will be that of the most up-to-date instructions for the NIH R01. More detailed instructions can be found in Appendix 2.

4. The format of the Qualifying Exam is a mock R01 grant application based on the student's current research interests and, hence, will likely overlap with the research that will subsequently be presented in the student's thesis proposal. The student may avail him/herself of the knowledge, resources and insights from his/her mentor's lab that have contributed to bringing his/her project to where it is. It is highly suggested and encouraged that the Specific Aims page be written with input with the student's mentor. However, the remainder of the document, including the Research Strategy, should be entirely written by the student with no new input from the advisor or members of the Qualifying Exam Committee (with the exception of the Chair of the Qualifying Exam Committee, who may be consulted on logistical matters at any point). Importantly, the studies proposed cannot be a mere reflection or minor extension of the mentor's research program. Rather, they must be designed in such a manner that the student is able to demonstrate: 1) a comprehensive understanding of the field; 2) a creative approach to important questions in the chosen area of research; and 3) critical thinking skills associated with experimental design, expected results, data interpretation, and understanding of potential pitfalls and hurdles that may be encountered in conducting the research. Therefore, although the topic is ingrained within the framework of the student's ongoing research, the Qualifying Exam must incorporate experiments and concepts that the student has not discussed with his/her mentor. The goal of this approach is to provide a venue through which the student is able to demonstrate his/her potential and independence for scholarly inquiry.

5. The student's mentor will take a minimal role in the process. Once the student is given the introductory talk regarding the Qualifying Exam, the student may then consult with his or her mentor to establish the general plan for the proposed research. The student and mentor can discuss potential hypotheses, why one topic or hypothesis might be more tractable than another, etc. From there, the mentor can advise the student through the process of writing the Specific Aims page. After this has taken place, the mentor has no further participation in the process.

6. The Program Director will appoint a Chair to oversee the entire process for all students in the Program. The Chair will select a committee to implement the exam; the student's mentor will not be a member of the committee, but may be asked to silently observe the oral portion of the exam. The committee will have one week to review the application, after which the student will have the oral exam, which is a defense of the document. The oral exam will generally last 75 minutes, but this can be shortened or lengthened depending on the circumstances that ensue. The student will first present a 15-minute summary and PowerPoint-presentation of his or her proposal, without interruptions from the committee. The 15-minute time limit will be strictly enforced. After this, the committee members will

question the student for the remaining portion of the exam. The vast majority of the questions will be confined to the research proposal and the checklist, although any committee member may ask anything that seems appropriate for the discussion.

7. Whether the student passes or fails the exam will be determined by the committee. The student, mentor, or any member of the committee can appeal the decision to the Neuroscience Steering Committee if there are any irregularities that should be addressed.

8. If the student fails the exam, he or she has a period of 3 months (90 days) to repeat the entire process, with a new topic, but the same committee. The student may request a change in the committee membership if he or she feels that there is bias, but such requests will only be honored if the Steering Committee is convinced that such bias exists. A second failure results in dismissal from the doctoral program.

9. Upon passing the Qualifying Exam, the student will be admitted to candidacy for the Ph.D. degree.

E. <u>Thesis Advisory Committee (see Appendix #3 for more detail)</u>

1. By six months after passing the Qualifying Exam, the student, in consultation with his/her advisor, will propose members of the faculty to serve on the Thesis Advisory Committee subject to approval by the Program Director and the Steering Committee. Once formed, this committee will meet every six months to review the student's progress.

a. Three or four of the five voting members of the Committee must be Graduate School faculty from the Neuroscience Graduate Program. To complete the five member Committee the student may select individuals who are members of the Graduate School faculty but not members of the Neuroscience Graduate Program or individuals who are specialists in the field but from outside the university (as approved by the Biomedical Graduate Education Committee). No more than 3 members of the committee (including the major advisor) may be from one Department. Committee members from outside Drexel University need to be approved by the Executive Committee of the Division of Biomedical Sciences; students should provide the program director with a CV or NIH-style biosketch that can be presented to the Executive Committee of the Division of Biomedical Sciences for approval.

b. The student's primary advisor is a voting member of the Committee but cannot chair the Committee.

c. The Chair of the Committee must not be a collaborator on the student's research project and must not have any apparent conflicts of interest related to the publication or funding of the student's project. It is also the responsibility of the Chair to ensure that there is sufficient balance on the committee to ensure a rigorous and unbiased critique of the student's project and progress. See Appendix #3 for more detail.

2. Following the bi-annual review by the Committee, a brief statement of the student's progress must be signed by each Committee member and submitted to the Steering Committee.

F. <u>Thesis Proposal</u>

1. The Thesis Proposal is a crucial exercise through which each student will be thoroughly evaluated by his or her Thesis Advisory Committee to ascertain his or her competence and appropriateness to continue in the doctoral program. The conclusion of the committee will be based on several factors (see below), which includes shortcomings displayed in any element of the program to date and the degree to which the student has overcome these shortcomings.

2. The Thesis Proposal document must be submitted by PhD candidates within one year of passing the Qualifying Exam. In the case of MD/PhD candidates, the document must be submitted within 6 months of passing the Qualifying Exam. Under special circumstances this can be extended via written request to, and approval from, the Steering Committee. The Thesis Proposal must be written in the style

and within the page limitations of an NIH R01 grant application and handed in 10 working days prior to formal presentation of the Thesis Proposal to his/her Thesis Advisory Committee. Font size, and other matters of format are precisely what are advised in the most up-to-date NIH R01 instructions, except that the page limit is 6-12 pages (to be decided by the Chair of the student's dissertation committee). Upon approval of the Thesis Proposal the student will continue with his/her thesis research, culminating on the presentation of the Ph.D. dissertation for defense.

3. At the time of the proposal the student must present a brief (10-15 minute) oral summary of his/her intended research project followed by a detailed question and answer session.

4. The Thesis Advisory Committee will reach a decision on the student's performance. If the decision is positive, the student may continue with his/her thesis research. If the decision is negative, the student can re-submit a revised or new proposal in three months and process will be undertaken a second time. If the decision is negative a second time, the student will either be dismissed from the program or recommended for a terminal Master's degree.

5. The decision of the Committee will be based on:
   a. the thesis proposal document
   b. the oral presentation
   c. performance in the questions and answers session
   d. demonstration that the student has overcome any and all shortcomings displayed in any element of the program to date, including the Preliminary Exam and the Qualifying Exam
   e. the committee being convinced that the student's abilities and performance in the laboratory are sufficient to actually conduct the proposed research effectively

G. Registration for Thesis Defense Only

The Thesis Committee will decide when the student has achieved sufficient progress that he or she may defend within two semesters. At that point, the Chair of the Committee will submit a letter to the Program Director, co-signed by the mentor of the student, indicating that a student has achieved this status. Once approved by the Program Director, the student may then register for Thesis credits only, and is excused from Journal Club. The student can register for "Thesis Only" for no more than two semesters.

H. Thesis

A thesis based on original research is requisite in partial fulfillment of requirements for the Ph.D. degree. The format of the thesis has been described in detail by the Office of Biomedical Graduate Studies, and this format must be followed precisely.

I. Defense

1. A candidate may not present him/herself for the final thesis defense until he or she has completed 24 calendar weeks of residence after satisfactory completion of the Thesis Proposal, and has the approval of his/her major advisor.

2. At least four weeks prior to the date of the commencement at which the degree is to be conferred, typewritten or photocopies of the thesis must be distributed to each member of the advisory-examination committee. Also at this time, the Chair of the Committee, or the Program Coordinator must notify the Office of Biomedical Graduate Studies, the Registrar's Office and all departments involved in graduate education of the scheduled date of the thesis defense.

3. The thesis defense will take place no less than two weeks and no more than four weeks after the thesis has been distributed to the members of the examination committee, except under written direction of the Steering Committee.

4. The thesis defense will be public. The candidate will be formally introduced by his/her advisor

or the Chair of the Committee. The candidate will present a 45-minute seminar on his/her research, followed by questions from the Examination Committee and the general audience. After this initial question and answer period, the chair will dismiss the audience. The Examination Committee will meet in private with the candidate to complete the examination process.

5. The Thesis Examination Committee shall decide upon the merits of the candidate's performance on the thesis defense. To be recommended for a doctoral degree, the candidate must receive approval of the Committee with no more than one dissenting vote. By permission of the Committee a candidate who has failed the final thesis defense may present him or herself for re-examination after three, but not more than twelve months. This re-examination must be taken within a calendar year of failure to pass the first examination. A report on each final thesis defense whether passed, failed, or recommended for re-examination must be filed by the Committee in the Office of Biomedical Graduate Studies.

6. Not later than four weeks prior to the commencement at which the degree is to be conferred, one printed copy suitable for binding and an electronic version of the completed thesis both bearing the approval of the advisory-examination Committee must be deposited in the Office of Biomedical Graduate Studies. If additional copies are requested, the cost of preparation, reproduction and personal binding copies are the candidate's responsibility.

TRANSFERING BETWEEN DOCTORAL AND M.S. PROGRAMS

Under certain circumstances, the Steering Committee of the program may recommend that a student be transferred from the Ph.D. program to the M.S. program. Students may also elect to apply for program transfers with the approval of the Program Director. All transfers must be approved by the Division of Biomedical Sciences Executive Committee.

Appendix 1
Policy for Laboratory Rotations for First Year Graduate Students

The purpose of this Appendix is to clarify the procedures and goals of rotations for first year doctoral students in the Neuroscience Program. During orientation, the new students will be given detailed information on the purpose of the rotations and the procedures by which rotations will be implemented.

1. Experience: Unless a rotation clearly proves to be non-productive at some point during the semester, we anticipate that each rotation will last for the complete duration of the semester for doctoral students. Coursework is heavier during the first year with the changes to the curriculum, and hence there is less time for students to attempt multiple rotations in a single semester. In consultation with the rotation advisor, students will have necessary time and flexibility for their coursework. All students must do at least two rotations (Fall and Spring semesters), and, if necessary, a third rotation in the Summer. While there are several purposes that rotations serve (getting a taste for hands-on research, having a home base and an advisor on academic as well as research matters, gaining a breadth of different laboratory experiences, etc.), the primary purpose of rotations is to make wise and informed choices in the selection of graduate mentors for each student. By the second and possibly the third semester, the student should be in the process of making a decision regarding his/her dissertation laboratory.

2. Exposure: During the rotations, the student and the faculty member should be evaluating each other to make sure that they can establish a healthy, long-term working relationship; the faculty member might wind up being the primary advisor or a member of the student's dissertation committee. It is absolutely crucial that all faculty members work in harmony toward the goal of placing each student in the laboratory that is best suited for him or her, and that faculty members do not take a selfish approach toward "recruiting" students to their laboratories. Issues of funding, space, time constraints, and other relevant factors should be taken into account, and all aspects of the decision-making process should be open and transparent to the faculty and student body.

3. Expectation: Rotations should <u>not</u> be treated as mini-thesis projects. By this we mean that projects should not be designed to end up as first-author publications for the student. Also, faculty members are discouraged from designing experiments that would require the student to spend more than one semester in their lab (unless it is the second or third rotation, <u>and</u> the student has decided to continue in that lab for his/her dissertation). Grades for rotations are PASS/FAIL, and a failing grade should reflect a lack of interest/attendance by the student. However, oversight by the steering committee should prevent students from getting a failing grade. Grades should not reflect the quality of the data and/or the success of the experiment. Expectations are that students will spend roughly 15-20 hours/week in the lab, exams permitting.

4. Execution. During orientation week, the Neuroscience Program will conduct programmatic orientation sessions in which faculty will present their research to the incoming students to assist the incoming students in deciding on potential rotations. The Program Director will consult with faculty members and students to assist in promoting the best possible matches for the first semester, and will finalize these decisions through contact with both the student and the faculty member. In many cases, these arrangements can be made even before students arrive for Orientation.

APPENDIX 2
Policies for the Qualifying Exam for Second Year Graduate Students

GENERAL GUIDELINES

The aim of the Qualifying Exam is to determine whether the student is qualified to continue in the Doctoral Program in Neuroscience at Drexel University College of Medicine. In order to pass, the student must receive a favorable vote of the members in the examination committee. If a student fails to pass the qualifying examination, the student will be provided one additional opportunity to take the examination. The student must successfully complete the second exam within 3 months of the failed qualifying examination with a new proposal.

There are three steps for the successful completion of the qualifying exam:

Step 1. Submission of a written grant proposal by the deadline as instructed.

Step 2. Oral presentation and defense of the grant proposal to the designed examination committee. At the end of step 2, the examination committee will provide a favorable or an unfavorable vote to the student. In addition, the committee will provide a written evaluation of the student's strengths and weaknesses identified during the evaluation process, related to the written document and oral presentation.

Step 3. In some cases, the student will pass without having to make any changes to the written document or without having to undergo additional oral questioning. In other cases, in order to successfully pass, a student will be asked to fully address the questions raised by the committee members. A one-page cover letter explaining how the questions are addressed and how the document is modified in response to the evaluation is needed. The letter should be submitted together with the modified document. The modified document should be highlighted by changes in **RED**. In some cases, that revised document will be sufficient; in others the student will be asked to undergo additional oral questioning and/or presentation.

COMPOSITION OF THE QUALIFYING EXAM COMMITTEE

The Steering Committee for the Qualifying exam will assign a Faculty Member without conflict of interest to Chair the Qualifying Exam Committee as well as three to four additional faculty members (also without conflict of interest) who, together with the Chair, comprise a voting panel of four to five members. The committee will be designed to provide both expertise and breadth.

THE ROLE OF THE STUDENT'S DISSERTATION ADVISOR

The format of the Qualifying Exam is a mock R01 grant application based on the student's current research interests, and hence will likely overlap with the research that will subsequently be presented in the student's thesis proposal. The student may avail him/herself of the knowledge, resources and insights from his/her mentor's lab that have contributed to bringing his/her project to where it is. However, the document should be entirely written by the student, with no new input from the advisor or faculty other than the Chair of the Qualifying Exam Committee. Importantly, the studies proposed cannot be a mere reflection or minor extension of the mentor's research program, but rather must be designed in such a manner that the student is able to demonstrate: 1) a comprehensive understanding of the field; 2) a creative approach to important questions in the chosen area of research; and 3) critical thinking skills associated with experimental design, expected results, data interpretation, and understanding of potential pitfalls and hurdles that may be encountered in conducting the research. Therefore, although the topic is ingrained within the framework of the student's ongoing research, the Qualifying Exam must

incorporate experiments and concepts that the student has not discussed with his/her mentor. The goal of this approach is to provide a venue through which the student is able to demonstrate his/her potential and independence for scholarly inquiry.

The student's mentor will take a minimal role in the process. Once the student is given the introductory talk regarding the Qualifying Exam, the student should consult with his or her mentor to establish the Specific Aims for the proposed research. The student and mentor can discuss potential hypotheses, why one topic or hypothesis might be more tractable than another, etc.

Specifically, the rules are:

- There should be agreement on the research plan between the student and mentor, including the Specific Aims. If, after discussing the Specific Aims with the Chair of the Qualifying Committee, the student would like to revise them, the student is encouraged to further consult his/her PI. Once the Specific Aims are finalized, the mentor will no longer be part of the process and should not be consulted by the student or, in any way, impose himself or herself in the process.

- The mentor should not edit or correct the Research Strategy of the written proposal (i.e. Significance, Innovation and Approach sections) scientifically, grammatically, structurally, or in any way. Once the proposal is submitted to the Chair of the Qualifying Exam Committee, the Chair will provide the mentor with a copy of the written document.

- The student should not practice with his or her mentor on the delivery of the oral presentation.

- The mentor must be aware that the Qualifying Exam is the top priority of students during the approximately 5-week period, and provide sufficient time for the student to prepare the document and prepare for the oral test. However, the student is not allowed to be totally absent from his/her laboratory work.

- At the time of the oral presentation, the mentor is invited to be present, but should not speak, vote, or express any opinions in defense of the student unless specifically asked or consulted by the Chair of the Qualifying Exam Committee.

- If the student and his/her mentor decide to submit an F31 predoctoral fellowship, the qualifying exam document can serve as a starting point or basis.

- Likewise, the Qualifying Exam document can also serve as a starting point for the Thesis Proposal. It is important to stress that the Qualifying Exam proposal is <u>not</u> the same as the Thesis Proposal. The latter, which will presumably share some aspects in common with the former, will be prepared in consultation with the student's mentor and under the guidance of the student's Thesis Committee and the Chair of that Committee.

1. GRANT PROPOSAL (DOCUMENT) GUIDELINES:

Be specific, creative, informative, and avoid redundancies. Organize the grant proposal to answer these questions:

1. What do you intend to do?

2. Why is the work important?

3. What has already been done or what we know and what we don't know about the topic?

4. How are you going to conduct the project?

5. What are the potential problems/caveats for the proposed experiments? Are there any alternative approaches to address these caveats?

FORMAT (NIH R01 grant)

Font: NIH approved font (i.e. Arial, Helvetica, Georgia, Palatino), 11 points. All margins should be at least 0.5 inches

Title page: should include the name of the student (in the header, right upper corner) and the title of the proposal (maximum 56 characters, including spaces for the title), as well as mentor's name

Abstract: One paragraph, maximum 350 words.

Narrative: Medical relevance, in layman's terms. 2-3 sentences.

SPECIFIC AIMS: 1 page with 2-3 aims. State the broad long-term objectives and what the proposed research is intended to accomplish, e.g., state the specific hypothesis that will be tested. Also briefly state medical relevance or clinical implication.

RESEARCH STRATEGY: 12 pages maximum (not including the title page, abstract, specific aims, or references)

A. Significance: State why the proposed research is important and how the specific hypothesis is formulated. Keep background to a minimum, only providing what background is needed to follow the logic of the proposal. (Typically ~ 1- 1.5 pages)

B. Innovation: What is new or novel for your proposed project? This could be techniques, approaches, or the idea/perspective. What are the novel discovery and/or specific findings from this project? (Typically less than 1 page)

C. Approach: This section includes preliminary data as well as research design and methods. The student may organize this section any way that works best for the particular proposal. The student may have preliminary data in a separate section, or intermingle the preliminary data in each aim. For preliminary data for the Qualifying Exam, the student may use any data (published or unpublished) that the student or his/her lab-mates have produced in the mentor's lab. However, any unpublished data not generated by the student himself or herself must be used with the permission of the person who generated it. Figures of data published by other laboratories may also be shown in the document, if highly relevant. Please indicate in the figure legend which of these is the case, i.e. reference the source appropriately. (Please note that each figure must have its own legend).

Start each aim with a statement of rationale, which can also include a bit more background than was provided in the Significance section. Describe the research design and the procedures to be used to accomplish the specific aims of the project. Include how the data will be collected, analyzed, and interpreted. Describe the methodology and its advantage over other methodologies. Discuss the potential difficulties and limitations of the proposed procedures and alternative approaches to achieve the aims. It is important to include animal numbers, data analysis, and statistics. As part of this section, provide a tentative sequence or timetable for the project.

Timetable for a proposed project (2-3 year plan).

References - Use a numerical format (using EndNote software is strongly recommended).

Instructions for outputting your document:

- PDF file

- Title page with title, student name, supervisor name, correspondence (Department and email)

- Right side header with your name

- Insert page number: center, bottom of the page

- Page limit – 12 pages excluding Title Page, Specific Aims, and References

- Fonts and space – Ariel, Georgia, Helvetica, Palatino, 11, Single-spaced (Titles of sections can be larger font)

- Margins - 1/2 inch sides, top and bottom

- Send the document by email attachment to THE CHAIR OF THE COMMITTEE.

- Deadline for submission: see Table 1

2. POWERPOINT PRESENTATION GUIDELINES:

- Your presentation must last no more than 15 min: you should practice and time your presentation beforehand to ensure that it can be delivered at this time. You will not be interrupted by questions during your presentation.

- You must be prepared to respond to any questions related to your project (including technical aspects) and basic neuroscience questions in general.

- Submit your PowerPoint presentation by email the day before your exam to THE CHAIR OF THE COMMITTEE or bring it on a USB memory disk.

Guideline for examining committee members (see sample scoring sheet below)

Three important points for faculty to consider regarding the evaluation of students:

1. PRESENTATION: Students have received instructions about the timing of their PowerPoint presentations as follows. The 15 min presentation will be followed by a 1 hour question period. Faculty will not ask questions during the presentation.

2. The student is asked to be prepared to respond to any questions related to his/her project (including technical aspects) as well as basic neuroscience questions in general.

3. YOUR QUESTIONS: There are 4-5 members on the committee and there is just one hour for questions. Therefore, each one of the examiners will get about 10 min to question the student. If there is a need to question the student further, we will ask him/her to return after the last student has finished at the end of the session.

4. After questioning, the student will be asked to exit the room and there will be a discussion by the committee members about his/her document and performance on presentation and questioning.

5. SCORING: You will be asked to give three scores (see Score and Comment sheet) at the end of the presentation (after the student leaves the room), i.e., document, presentation and question. The score will be based on a scale between 1 and 9 (1 being the best and 9 being the worst) without decimal, similar to those used by NIH grants
http://grants.nih.gov/grants/peer/guidelines_general/scoring_system_and_procedure.pdf

6. Importantly, the committee will point out the strengths and weaknesses that the student should pay attention to correct in his/her document, presentation, and oral defense.

7. Finally, the committee will provide a favorable or an unfavorable vote to the student.

Score and Comment Sheet for the Neuroscience Qualifying Exam

There are 3 scores (1-9 scale, with 1 being the best and 9 being the worst) on:

— **Document** (see the sheet below)
— **Presentation**
— **Question**

Reference: new NIH grant scoring system

Impact	Score	Description	Additional guidance on strengths/weaknesses
High	1	Exceptional	Exceptionally strong with essentially no weaknesses
	2	Outstanding	Extremely strong with negligible weaknesses
	3	Excellent	Very strong with only some minor weaknesses
Medium	4	Very good	Strong but with numerous minor weaknesses
	5	Good	Strong but with at least one moderate weakness
	6	Satisfactory	Some strengths but also some moderate weaknesses
Low	7	Fair	Some strengths, but with at least one major weakness
	8	Marginal	A few strengths and a few major weaknesses
	9	Poor	Very few strengths and numerous major weaknesses

Minor Weakness: An easily addressable weakness that does not substantially lessen impact
Moderate Weakness: A weakness that lessens impact
Major Weakness: A weakness that severely limits impact

- **Pass**: average ≤ 3 and without any score > 4 from individual committee members
- **Presumptive pass (Minor revision)**: average score ≥ 3 but have score(s) > 4. The student needs to address the questions raised by committee members who gave 5 or higher. Response within 3 days.
- **Major revision**: average score ≥ 5 on document need to be revised and re-scored within 1-3 weeks.
- **Fail**: re-score average ≥ 4 after major revision, or first version document scored 6 or higher. Retake exam within 3 months.

Note: the committee will determine **Pass** or **Fail** on presentation and questions who have scored > 4.

Document: Each of the following areas should be considered for scoring of the document.

1. Creativity/innovation of the proposal.
2. The hypothesis is specific and clearly stated.
3. The questions/rationales are clearly stated and comprehensive.
4. The hypothesis is logical and consistent with the questions.
5. The research procedures are clearly stated and easy to follow.
6. All essential materials, such as antibodies, agonist/antagonist, are listed and the procedure accurately tests the questions stated.
7. Experiments were well-controlled and repeated for validity.
8. Possible results are clearly predicted.
9. Potential problems/caveats are clearly discussed and alternative experiment is selected.
10. There are sufficient data to state a conclusion and a logical conclusion can be drawn.
11. Animal numbers, data analysis, and statistical methods are listed.
12. The document is neat, easy to read, and the whole proposal is logic, consistent, and complete.

APPENDIX 3
Thesis Committee Guidelines and Chair Responsibilities

Committee membership is approved by the Program Director and the Steering Committee.

Chair of committee is nominated by the student and his/her mentor from the committee membership and approved/appointed by the Program Director.

The Chair of the Committee must not be the student's primary advisor or a collaborator on the student's research project and must not have any apparent conflicts of interest related to the publication or funding of the student's project. It is the responsibility of the Chair to:

i. ensure that there is sufficient balance on the committee to ensure a rigorous and unbiased critique of the student's project and progress.
ii. ensure that sufficient progress is being made in the student's research and other scholarly endeavors.
iii. ensure that the research being conducted by the student will culminate in a high quality cutting-edge publishable body of work, and that at least a portion of it is published in a journal respected in the field of major advisor.
iv. intervene if appropriate progress is not being made, or if there are any conflicts between the student and the major advisor
v. report to the Program Director if there are any apparent issues or problems with any of the items listed above that can not be resolved with the student and advisor, so that that intervention can occur at the programmatic level.

It is the responsibility of the Chair of the Committee to be well versed in the expectations and guidelines of the program so that he or she can appropriately take on these duties and responsibilities.

Chair responsibilities:

- Schedule <u>required</u> meetings of the committee in conjunction with the student (initial meeting followed by meetings to discuss progress @ six month intervals)
- Set agenda for the meeting
- Conduct of the meeting
  - Student leaves the room for faculty discussion.
  - Committee reviews student progress, i.e. transcript, publications, abstract submissions, IDP
  - Initial meeting - student presents project proposal (20 minutes) followed by Q & A from the committee. The initial meeting should occur within 6-12 months after the qualifying exam.
  - Progress report meetings – student presents initial aims and documents progress on completed and ongoing aims followed by Q & A from the committee.
  - Chair moderates Q & A session
  - Student leaves the room for faculty discussion moderated by the chair.
  - Student returns and chair summarizes faculty comments and recommendations. Recommendations may include: "approval of project," "request for revision of project," "approval of progress," "modification of project goals depending upon progress."
- Chair insures that all required forms are signed and completed by student and committee members.

- Meeting follow-up – Chair provides a written summary of the student's performance and recommended actions including suggestions and changes to the project. Written summary is distributed to the student and all committee members. The student acknowledges in writing to accept the advice/recommendations of the committee.

Thesis Committee Forms – can be found at http://webcampus.drexelmed.edu/bgs/forms/
(see appended forms below)

DREXEL UNIVERSITY
Graduate School of
Biomedical Sciences
and Professional Studies
College of Medicine

DISSERTATION COMMITTEE

Student Name:

Program:

Email:

Members of the Committee:

Printed Name/Title	Signature	Date
Printed Name/Title	Signature	Date
Printed Name/Title	Signature	Date
Printed Name/Title	Signature	Date
Printed Name/Title	Signature	Date

Printed Name of Program Director Date

Signature of Program Director Date

Student's Signature Date

Division of Biomedical Sciences 2900 Queen Lane Suite G24
Philadelphia, PA 19129 Tel: 215.991.8570 Fax: 215.843.5810
Web: www.drexelmed.edu/biograd/

DREXEL UNIVERSITY
Graduate School of
Biomedical Sciences
and Professional Studies
College of Medicine

REPORT OF DISSERTATION COMMITTEE MEETINGS

Required every 6 months

Name of Student:
Date of Meeting:
Date of next committee meeting:

Committee Members: **(Print Name & Email)**

_____

Chairperson

_____

_____

_____

_____

• Comments (please refer to suggested topics on next page to be discussed at committee meetings):

• Please asses the ability of this student to function collaboratively and professionally in a scientific setting. **(e.g. department seminars, scientific meeting, lab meeting, journal club)**

☐ **Satisfactory**

☐ **Unsatisfactory, needs improvement (please comment)**

IDP has been reviewed and accepted.

○ ○

Division of Biomedical Sciences 2900 Queen Lane Suite G24
Philadelphia, PA 19129 Tel: 215.991.8570 Fax:
215.843.5810 Web: www.drexelmed.edu/biograd/

DREXEL UNIVERSITY
Graduate School of
Biomedical Sciences
and Professional Studies
College of Medicine

NOTIFICATION OF INTENT TO DEFEND

Name:

Program:

Date:

The defense of my dissertation will be held: **(If you need a room, please request within the DBS office)**

Date:

Room:

Time:

Title:

_____

The members of my Dissertation Committee are listed below. I have attached the complete address of any members not affiliated with Drexel University.

_____
_____
_____
_____

*Notice of Defense must be posted by your Department/Program at least two weeks before your defense date.

_____
Chairperson's Signature

Division of Biomedical Sciences 2900 Queen Lane Suite G24
Philadelphia, PA 19129 Tel: 215.991.8570 Fax:
215.843.5810 Web: www.drexelmed.edu/biograd/

DREXEL UNIVERSITY
Graduate School of
Biomedical Sciences
and Professional Studies
College of Medicine

DISSERTATION DEFENSE

On ,
(Date) (Student's Name)

_____ successfully; _____ did not successfully, defend his/her Dissertation.

The committee certifies that the above-named candidate has completed all requirements for the degree of Doctor of Philosophy in Neuroscience and recommends this candidate for the awarding of the degree at Commencement.

Recommendations of the committee are noted below.

Comments:

Signatures/Printed name of Examining Committee:

_____ _____
Chairperson

_____ _____

_____ _____

_____
Student's Signature/Date

Division of Biomedical Sciences 2900 Queen Lane Suite G24
Philadelphia, PA 19129 Tel: 215.991.8570 Fax:
215.843.5810 Web: www.drexelmed.edu/biograd/

DREXEL UNIVERSITY
Graduate School of
Biomedical Sciences
and Professional Studies
College of Medicine

CERTIFICATION OF DISSERTATION

Date:

This is to certify that the accompanying copies of the PhD Dissertation of

_____ , are complete and correct, as approved by the

Dissertation Examining Committee, and are in satisfactory form to be bound.

_____
Examining Committee Chairperson (Name)

_____
Examining Committee Chairperson (Signature)

_____
Student's Signature

Division of Biomedical Sciences 2900 Queen Lane Suite G24
Philadelphia, PA 19129 Tel: 215.991.8570 Fax: 215.843.5810
Web: www.drexelmed.edu/biograd/