



College of Medicine

*Department of Pharmacology
and Nutritional Sciences*

Handbook:

Ph.D. Program in Nutritional Sciences

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This handbook is a guide for students of the Ph.D. program in Nutritional Sciences, their academic advisors and other faculty members. The handbook provides an overview of the requirements and processes, degree and curriculum requirements, references and links to forms that need to be completed, Graduate School resources and other valuable information. For additional information, please consult the department's website: <https://medicine.uky.edu/departments/pharmns/phd-program>

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Welcome New Graduate Students

The Division of Nutritional Sciences hopes your graduate years will be enjoyable and rewarding, and also challenging and successful. The information herein is intended to serve as a guide for your matriculation through our graduate program. Students should familiarize themselves with the information provided herein, and with that described in the [Graduate School Bulletin](#).

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Mission

The PhD program in Nutritional Sciences is an interdisciplinary program that provides high-quality educational training and research experience across a wide spectrum of nutrition-related subjects. The program's mission is to train highly skilled nutritional scientists equipped to tackle critical nutrition-related disease and health issues and pursue promising careers in academic, industrial, governmental, and professional environments in the rapidly expanding field of nutritional sciences.

Program Overview

The PhD Program in Nutritional Sciences was established in 1989 to provide an opportunity for advanced multidisciplinary graduate studies in nutrition. Nutritional Sciences became a Graduate Center in 2000, and in 2014 merged with the Department of Pharmacology and became a Division within the Department of Pharmacology and Nutritional Sciences. Through its Ph.D. and Masters' of Science programs, the Division of Nutritional Sciences enables students to explore the interrelationship between environmental factors and nutrients and their effect on biochemistry, physiology and disease development. Students have access to faculty expertise across 28 departments and divisions within the University's Colleges of Medicine, Pharmacy, Health Sciences, Nursing, Agriculture, Arts and Sciences, and Education. Administratively, the graduate program is housed in the Department of Pharmacology and Nutritional Sciences in the College of Medicine.

One of the primary areas of research and training targets nutrition and chronic diseases, with a focus on obesity and associated disorders of cardiovascular disease, diabetes and cancer. Other areas of specialty include nutrition and oxidative stress, clinical nutrition and animal nutrition.

More than 60 faculty members housed in 6 different colleges provide teaching and individualized research guidance for graduate students in academic units including Animal Sciences; Biochemistry; Clinical Sciences; Dietetics and Human Nutrition; Horticulture and Landscape Architecture; Internal Medicine; Kinesiology and Health Promotion; Microbiology and Immunology; Neurology; Neuroscience; Nursing; Pharmacology and Nutritional Sciences; Pharmaceutical Sciences; Physiology; Plant Sciences; Surgery; and Toxicology and Cancer Biology.

Research Opportunities and Resources

Approximately 36,000 square feet of laboratory space have been dedicated to Nutritional Sciences. This research space houses state-of-the-art equipment for cell culture, human and animal studies using state-of-the-art trace mineral, vitamin, lipid, amino acid, hormone, enzyme, stable and radioactive isotope, microcirculatory, energy assessment, electrophoresis and molecular biology technologies. The University of Kentucky has in place multiple core facilities, among them a microarray facility as well as cores for electron microscopy, confocal microscopy, flow cytometry, metabolomics, and magnetic resonance imaging.

Clinical research facilities for training and research, all within walking distance of each other, include the Center for Clinical and Translational Science, the University of Kentucky Hospital, the Veterans Administration Hospital, Sanders-Brown Center on Aging, the Gill Heart Institute, the University of Kentucky Medical Center Outpatient Clinics, and the Markey Cancer Center. Both the UK Medical Center and the VA Medical Center have clinical research units with ongoing nutritional studies. Opportunities for community-based research exist locally, throughout the state and in international settings.

ADMISSIONS

There are two ways to be admitted into the Nutritional Sciences PhD Program:

1. Through the Integrated Biomedical Sciences Program (IBS)

The IBS program is composed of first year biomedical graduate students in the College of Medicine, University of Kentucky. Participating departments and centers include Neuroscience; Microbiology, Immunology & Molecular Genetics; Pharmacology & Nutritional Sciences; Molecular & Cellular Biochemistry; Toxicology & Cancer Biology; and Physiology. The IBS Program consists of both coursework and laboratory rotations completed during the first year of graduate school. All IBS students perform four laboratory rotations (two per semester) among any of the participating departments. The purpose of the rotations is for the student to gain experience in a working scientific lab and to find a faculty member who will serve as a Dissertation Advisor. Selection of a Dissertation Advisor is a mutual decision of the student and faculty member and is made by the end of the spring semester.

Detailed information about applying to the IBS program can be obtained at:

<http://graduate.med.uky.edu/integrated-biomedical-sciences> or by directly contacting the IBS program by e-mail: COMIBS@uky.edu.

2. Direct admission into Nutritional Sciences

Applicants must meet the following requirements for admission to the University of Kentucky Graduate School and the Graduate Program in Nutritional Sciences:

1. A baccalaureate degree from a fully accredited institution of higher learning.
2. An M.S. degree with a Grade Point Average (GPA) of 3.2 or above on a 4.0 scale, or a B.S. degree with a GPA of 3.0 or above on a 4.0 scale.
3. For international applicants, a minimum score of 550 out 667 maximum possible is required on the paper-based Test of English as a Foreign Language (TOEFL), a minimum 213 score on the computer-based TOEFL (maximum 300), or 79 on the internet-based TOEFL. The minimum International English Language Testing Service (IELTS) score is 6.5. All applicants must demonstrate proficiency in verbal and written English.

All those interested in graduate study at the University of Kentucky Graduate School must apply online via Hobson's [ApplyYourself Application Network](#). There is a \$65 application fee for domestic applicants and a \$75 application fee for international applicants. Please note that the application cannot be submitted without paying this fee.

The following information must be submitted online to the Graduate School via [ApplyYourself](#):

1. **Transcripts** from all higher education institutions attended. The Graduate School requires an overall undergraduate grade point average of 2.75, and 3.00 on all graduate work.
2. **TOEFL or IELTS** scores are required for all applications whose native language is not English.
 - TOEFL scores should be sent directly from ETS; the Institutional Code for the TOEFL for the UK Graduate School is 1837.
 - IELTS scores should be sent directly from the IELTS, specifying the University of Kentucky Graduate School, Lexington, KY as the recipient institution.

3. Curriculum vitae
4. A brief essay, no longer than two single-spaced pages, describing long-term career goals and how the Ph.D. Program in Nutritional Sciences would advance these goals.
5. Three letters of recommendation
6. Completed [Research Assistant Application Form](#).

Application Deadlines

Application deadlines for Graduate School admission are as follows:

	<u>Fall Admission</u>	<u>Spring Admission</u>
<u>Domestic</u>	<u>July 15</u>	<u>December 1</u>
<u>International</u>	<u>February 1</u>	<u>August 15</u>

State Residency Requirements

The University of Kentucky and all other state-supported institutions of higher education assess tuition fees based on Kentucky or non-Kentucky residency. The Commonwealth of Kentucky Council on Post-Secondary Education establishes the policy determining residency. Students with residency questions should contact the Registrar’s Office in the Funkhouser Building.

THE NUTRITIONAL SCIENCES CURRICULUM – DIRECT ADMISSION OR THROUGH IBS

Nutritional Sciences students follow the curriculum described below. Students may enter the Nutritional Sciences Program from IBS or through direct admission (year 1). Students with extensive prior training in nutrition may petition the Graduate Committee to evaluate modification of the curriculum. Note that graduate students must register for a minimum of 9 hours per semester to remain a full-time student until they pass their qualifying exam.

Some courses are cross-listed with other units and departments. Students should always register under the prefix of the primary instructor's department.

CORE CURRICULUM FOR PHD PROGRAM IN NUTRITIONAL SCIENCES

NS 601	Integrated Nutritional Sciences Part I	(3)
NS 602	Integrated Nutritional Sciences Part II	(3)
CNU/NS 603	Integrated Nutritional Sciences Part III	(2)
CNU/NS 609	Ethics in Clinical Sciences Research	(1)
or TOX 600	Ethics in Scientific Research	(1)
NS704	Current Topics in Nutritional Sciences	(1)
NS 771	Seminar in Nutritional Sciences**	(1+)**
IBS 611	Practical Statistics	(2)
or STA 570	Basic Statistical Analysis	(3)
IBS 601/BCH 607	Biomolecules & Metabolism	(3)
IBS 602	Molecular Biology & Genetics	(3)
IBS 603	Cell Biology & Cell Signaling	(3)
IBS 606	Physiological Communications	(3)
or PGY 412G	Principles of Human Physiology	(4)
or PGY 502	Principles of Systems, Cellular & Molecular Physiology	(5)
Electives		(7-12)
Total Credits		36

**All Ph.D. students must present 1 seminar prior to their qualifying exam and register for one credit in NS 771 in semesters before the qualifying exams. In the semester that the qualifying exam is taken and in semesters following the qualifying exam, students must register for NS 771 for 0 credit hours. In addition, all doctoral candidates will present a seminar once/year post-qualifying exam and enroll in NS 771 for 0 credits.

Description of Core Courses

NS 601	Integrated Nutritional Sciences I	3 credits
The material covered in CNU/NS 601 consists of three major emphasis areas: (1) review of carbohydrate, lipid, and protein structure, synthesis, absorption, and metabolism, (2) the impact of nutritional influences on macronutrient metabolism to health and disease, (3) the influence of macronutrient metabolism on the regulation of energy balance.		
NS 602	Integrated Nutritional Sciences II	3 credits
Integrated study of the properties, metabolism, biochemical and physiological functions and interactions of vitamins and minerals, and their relationships to chronic diseases, deficiency symptoms and toxicity.		
CNU/NS 603	Integrated Nutritional Sciences III	2 credits
Working knowledge of dietary requirements and guidelines, nutritional assessment, food safety issues and nutritional requirements through the lifecycle. This is a web-based course.		
NS 771	Graduate Seminar in Nutritional Sciences	0-1 credit**
Seminars by students, postdoctoral fellows and faculty both internal and external to the University in areas of nutritional sciences		
NS 704	Current Topics in Nutrition	1 credit
This course is designed to develop the student's independent thinking and critical analysis related to various nutritional sciences issues. These skills will be developed through reading assignments and group discussion related to current topics in nutrition.		
CNU/NS 609	Ethics in Scientific Clinical Research	1 credit
Students will examine ethical issues in biomedical research using a case-study approach. Representative issues addressed may include data selection and retention, plagiarism, scientific review of grants and manuscripts, scientific misconduct, and informed consent.		
TOX 600	Ethics in Scientific Research	1 credit
The course will commence with an overview of good laboratory practices and present them as the basis of good scientific research, along with an overview of quality assurance and appropriate practices in data analysis and data interpretation. The course will then move to the ethics of human and animal experimentation and discuss the concepts of data and intellectual property, their ownership and access to them. The problems of reviewing other workers' intellectual property such as grant applications; research papers and other intellectual property will be addressed.		
STA 570	Basic Statistical Analysis	3 credits
Introduction to methods in biological, behavioral and social sciences data analyzing, surveys, the role of statistics in research, statistical concepts and models, probability and distribution functions, estimation, hypothesis testing, regression and correlation, analysis of single and multiple classification models.		

NUTRITIONAL SCIENCES PhD CURRICULUM: YEAR 1

Courses taken the first year by students in Nutritional Sciences will vary, depending on whether the student enters the program directly, or through the IBS program.

FIRST YEAR CURRICULUM FOR STUDENTS ENTERING THROUGH IBS:

IBS Curriculum, FALL Semester

IBS601	Biomolecules and Metabolism (3*)
IBS602	Molecular Biology and Genetics (3)
IBS610	Critical Reading/Small Groups (2)
IBS611	Practical Statistical Applications (2)
IBS607	Seminar in IBS (0)
IBS609	Research in IBS (1)

IBS Curriculum, SPRING Semester

IBS603	Cell Biology and Cell Signaling (3)
IBS606	Physiological Communications (3)
IBS608	Special Topics in IBS (2)
IBS607	Seminar in IBS (0)
IBS609	Research in IBS (1)
TOX600	Ethics (1)

SAMPLE FIRST YEAR CURRICULUM FOR STUDENTS DIRECTLY ADMITTED INTO NUTRITIONAL SCIENCES:

YEAR 1, FALL Semester

IBS 601	Biomolecules & Metabolism	3 credits
IBS 602	Molecular Biology and Genetics	3 credits
NS 609	Ethics in Clinical Research	1 credit
NS 771	Graduate Seminar in Nutritional Sciences	1 credit
Elective		2-3 credits

YEAR 1, SPRING Semester

IBS 603	Cell Biology and Cell Signaling	3 credits
IBS 606	Physiological Communications	3 credits
NS 771	Graduate Seminar in Nutritional Sciences	1 credit
Elective		2-3 credits

SAMPLE SECOND YEAR NUTRITIONAL SCIENCES PhD CURRICULUM:

Courses taken the second year will vary, depending on whether the student entered the program directly or through the IBS program, and the particular interest of the student.

YEAR 2 CURRICULUM, FALL Semester (example)

NS 601	Integrated Nutritional Sciences I	3 credits
STA 570	Basic Statistical Analysis	3 credits
NS 771	Graduate Seminar in Nutritional Sciences	1 credit
CNU/NS 603	Integrated Nutritional Sciences III	2 credits
Elective		variable

YEAR 2 CURRICULUM, SPRING Semester (example)

NS 602	Integrated Nutritional Sciences II	3 credits
NS 704	Current Topics in Nutrition	1 credit
NS 771	Graduate Seminar in Nutritional Sciences	1 credit
Elective		≥4 credits

SEMINAR POLICIES

Doctoral students are required to register for and attend the Department of Pharmacology and Nutritional Sciences seminar series every semester. Before taking the qualifying exam, students should register for 1 credit hour; students will receive a letter grade (A, B, C, or E) in the course. For the semester of the qualifying exam and in the following semesters, students should register for 0 credit hours; this will be graded on an S/U basis. Students are required to present one seminar before the qualifying exam, and one seminar per year after the qualifying exam. The first two seminars (in years 2 and 3) will be 30-minute presentations. Subsequent seminars will be one-hour presentations.

ELECTIVE COURSES

Students must successfully complete a minimum of 7-12 credit hours in electives to meet the minimum requirement of 36 total credits. Elective courses are recommended by the Advisor and approved by the Advisory Committee. Note, IBS 610 & 608 taken in year one by students admitted through the IBS program fulfill elective requirements.

Elective Courses Typically Selected by Students in Nutritional Sciences PhD program:

IBS 607	Seminar in Integrated Biomedical Sciences	0 credit
IBS 608	Special Topics in Integrated Biomedical Sciences	2 credits
IBS 609	Research in Integrated Biomedical Sciences	1 credit
NS/PHA 550	Drug and Nutrient Interactions (ONLINE)	2 credits
NS 606	Molecular Biology Applications in Nutrition	2 credits
NS/CNU 689	Nutrition and Chronic Diseases (ONLINE)	3 credits
NS 790	Research in Nutritional Sciences (Before qualifying exam)	1-6 credits
CNU 501	Nutraceuticals and Functional Foods	2 credits
CNU 502	Obesity C2C: Cell to Community	2 credits
CNU 611	Advanced Medical Nutrition Therapy	2 credits
CNU 612	Examination Skills for the Clinical Nutritionist	2 credits
CNU/NS 605	Wellness and Sports Nutrition	3 credits
CNU/NS 702	Problem-Based Case Studies	1-5 credits
ASC 681	Energy Metabolism	3 credits
ASC 683	Protein metabolism	3 credits
ASC 689	Physiology of Nutrient Digestion/Absorption	3 credits
ASC 684	Advanced Ruminant Nutrition	3 credits
ASC 686	Advanced Non-ruminant Nutrition	3 credits
FSC 638	Food Proteins	3 credits
FSC 640	Food Lipids	3 credits

FSC 434G	Food Chemistry	4 credits
BCH 610	Biochemistry of Lipids and Membranes	3 credits
BCH/BIO/MI 615	Molecular Biology	3 credits
CPH 605/PM 620	Epidemiology	3 credits
CPH 645	Food Systems, Malnutrition and Public Health	3 credits
EDP 661	Counseling Techniques II	3 credits
GS 610	College Teaching	3 credits
GS 650	Preparing Future Faculty	2 credits
KHP 420G	Physiology of Exercise	3 credits
KHP 620	Advanced Exercise Physiology	3 credits
KHP 720	Sports Medicine	3 credits
MI 685	Advanced Immunology	3 credits
MI 710	Molecular Cell Biology	3 credits
PGY 604	Advanced Cardiovascular Physiology	3 credits
PGY 607	Hormonal Control Mechanisms	3 credits
BCH 609	Plant Biochemistry	3 credits

DOCTORAL CANDIDACY

Students become doctoral candidates after passing the qualifying exam. Students have five years to earn their doctoral degree after the exam, unless the Graduate School is petitioned to allow additional time. Doctoral candidates who have passed their qualifying exam will register for **NS 767** (Dissertation Research, **2 credit hours**) every semester; students who have completed all required coursework should also register for NS 767 (2 credits) the semester they take the qualifying exam. Students are also required to register for seminar (NS 771) for 0 credit hours every semester while they are doctoral candidates.

A useful check sheet for Doctoral Students can be found on the Graduate School Website:

http://gradschool.uky.edu/sites/gradschool.uky.edu/files/check_sheet_for_doctoral_students.pdf

A. DISSERTATION ADVISOR AND ADVISORY COMMITTEE

The Dissertation Advisor and Advisory Committee should be formally appointed by the Graduate School during **your first year in the program**. This will require completion of the "Doctoral Advisory Committee Request" online form (https://ris.uky.edu/cfdocs/gs/DoctoralCommittee/Selection_Screen.cfm). Three of your committee members must be Associate Professors or Professors. Also, three of your committee members must be Nutritional Sciences graduate faculty; the fourth member must be a faculty member who is NOT a member of the Nutritional Sciences graduate faculty. On the graduate faculty information site, <https://ris.uky.edu/cfdocs/gs/dgsgradfac/>, the code for Nutritional Sciences graduate faculty on the dropdown list is N-S; Nutritional Sciences. The department's website includes a page listing of Nutritional Sciences graduate faculty: <https://pharmns.med.uky.edu/pharmns-nutritional-science-faculty>.

Every effort should be made to maintain the same committee composition throughout your tenure as a doctoral student. Should a change be necessary, for example when an Advisory Committee member leaves the university or retires, a formal request must be made to and approved by the Graduate School. To do this you must complete a "Doctoral Advisory Committee Modification Request" form which is available after you log in at the link above.

B. QUALIFYING EXAMINATION

A qualifying examination is required of all doctoral students. It verifies that the student has sufficient understanding of and competence in his/her chosen field in order to become a Doctoral Candidate. At a minimum, you must complete the equivalent of two years of residency (36 graduate credit hours) to be eligible to sit for the qualifying examination. The request to schedule the oral qualifying examination must be submitted to the Graduate School a minimum of 6 weeks in advance of the planned date.

https://ris.uky.edu/cfdocs/gs/DoctoralCommittee/Selection_Screen.cfm

Qualifying Exam Checklist:

- ✓ Complete all course requirements for the Nutritional Sciences PhD Program.
- ✓ Consult with Ms. Veronique Thibault **prior to** scheduling your oral exam with your Advisory Committee to avoid departmental conflicts.
- ✓ Schedule a time to take your oral exams with your Advisory Committee. A helpful website to use when trying to schedule a time to meet with committee member is www.doodle.com.
- ✓ Reserve a room for your oral exam. For help finding a room email Veronique Thibault (vthibau@uky.edu).
- ✓ Submit a completed "Recommendation for Qualifying Examination" form to the Graduate School at least 6 weeks prior to the scheduled examination. The date, time, and room number on this form are for your oral exam.

https://ris.uky.edu/cfdocs/gs/DoctoralCommittee/Selection_Screen.cfm

The Qualifying Examination comprises 3 parts and should be completed in four weeks starting with the first day of the closed book exam.

Qualifying Exam Format:

- (1) The completion of a research proposal on a novel topic developed in consultation with the Dissertation Advisor and approved by the Advisory Committee,
- (2) written examination consisting of questions provided by each Advisory Committee,
- (3) an oral Exam

More on the Qualifying Exam:

Research proposal. Students must complete a research proposal on a novel topic developed in consultation with the Dissertation Advisor and approved by the Advisory Committee. The research proposal must be developed and written independently. The proposal is due seven (7) days before the oral examination. The student is encouraged to initiate development of the proposal as early as possible after entry into the program.

Written examination. The Dissertation Advisor coordinates the written examination by requesting all members of the Advisory Committee to provide questions that may either be "opened" or "closed"

book, per the Advisory Committee members' preferences. Each Advisory Committee member should stipulate how long the student has to answer their question(s) (typically ~3 hours). The written examination must be completed within one week. Students may take each committee member's written examination on separate days, or take two exams per day. The written examination is not proctored, unless by the Dissertation Advisor. Students should make a request to Veronique Thibault to reserve a classroom or small conference room for their closed book written examination at least one week in advance. The written examination must be started no earlier than 4 weeks from the date of the oral exam that has been scheduled with the Graduate School.

Oral Exam. The oral exam will usually concentrate on weaknesses found in the research proposal and the written exam portions but can be directed to any of the material covered in the student's curriculum.

- For the oral exam, the Director of Graduate Studies will send the Dissertation Advisor the degree card and evaluations for all committee members to complete. The Dissertation Advisor should return the signed degree cards to the Director of Graduate Studies, who will deliver to The Graduate School.
- If the result of the qualifying exam is Failure, the Advisory Committee determines the conditions to be met before another examination may be given. The minimum time between examinations is four months; however, a second examination must be taken within one year after taking the first examination. A third examination is not permitted.

C. DEGREE GUIDELINES/GENERAL GRADUATE SCHOOL REQUIREMENTS

An "Application for Degree" must be filed with the Graduate School **within 30 days** after the beginning of the semester that the student expects to complete his/her work.

<https://myuk.uky.edu/irj/portal> (Click on Student Services / myRecords / Graduate Degree Application)

The Ph.D. degree will be conferred on a candidate who has:

- ✓ Completed all coursework
- ✓ Passed a comprehensive qualifying examination
- ✓ Given one (1) departmental seminar before, and every year after, the Qualifying Exam
- ✓ Presented a satisfactory dissertation
- ✓ Passed a final oral examination
- ✓ Shows evidence of creative scholarly attainment

Link to Graduate School Forms: <http://gradschool.uky.edu/studentforms/>

D. DOCTORAL DISSERTATION

Prior to the Final Examination, the doctoral candidate must present a dissertation that represents the culmination of a major research project. It must be a well-reasoned, original contribution to knowledge in the field of study and should provide evidence of high scholarly achievement. The student's Dissertation Advisor will provide the primary guidance in planning and preparing the dissertation; however, other members of the Advisory Committee should be consulted and may be involved as well.

A draft dissertation must be reviewed by the student's Dissertation Advisor at least eight weeks ahead of the defense date, as detailed below.

In general, the dissertation should include an introduction/background chapter, methods (presented as a separate chapter or embedded in other chapters), two or more research results chapters, and a conclusions/future directions chapter. Research results chapters that are self-contained and that are in the format of published manuscripts are encouraged.

The Advisory Committee must approve the dissertation two weeks before the scheduled defense. The dissertation format must conform to the specific instructions prepared by the Graduate School. A copy of the Instructions for the Preparation of Theses and Dissertations may be obtained from the Graduate School Website: <http://gradschool.uky.edu/thesis-dissertation-preparation>

Dissertation fee payments should be made at the Student Billing Services, 18 Funkhouser Building. Students may also have their dissertation copyrighted if desired. See the UK Graduate Bulletin for details.
<http://gradschool.uky.edu/graduate-school-bulletin>

E. FINAL EXAMINATION

Students are eligible to sit for the final doctoral examination after completion of two semesters of post-qualifying residency. The Final Examination will consist of a formal seminar presentation that is open to the public followed by an oral exam. The exam will include a defense of the dissertation and may be as comprehensive in the major and minor areas as the Advisory Committee chooses. An expanded Advisory Committee chaired by the Dissertation Advisor conducts the oral examination. The Dean of the Graduate School and the President of the University are “ex officio” members of all final examination committees.

The examination is a public event; scheduling is published and announced prior to the date of defense. Any member of the University may attend.

More on the Final Doctoral Exam:

- (1) Note, the Final Examination must take place no later than **eight days prior to the last day of classes of the semester** in which the student expects to graduate.
- (2) In order to provide sufficient time for the Graduate School to identify an outside examiner, you must submit the Notification of Intent to Schedule a Final Doctoral Examination (NOTIF) a minimum of eight weeks before the anticipated defense date. The Director of Graduate Studies will not approve the NOTIF on behalf of the student unless two conditions are met:
 - √ A rough draft of the dissertation is submitted electronically to the Director of Graduate Studies
 - √ The Dissertation Advisor notifies the Director of Graduate Studies in writing that the student is on track to complete a final draft by the target date. ([Dissertation Progress Form](#))
- (3) Upon receipt of the NOTIF, the Graduate Dean appoints an Outside Examiner as a core member of the Advisory Committee. Once an Outside Examiner is appointed, a date and time can be set for the exam. Please consult with Ms. Veronique Thibault (vthibau@uky.edu) before finalizing dates and times to ensure that your dissertation seminar and defense do not conflict with any departmental events. A helpful website to use when trying to schedule a time to meet with committee members is www.doodle.com.

- (4) Once you have finalized the date and times, you should also reserve rooms for both your dissertation seminar and oral exam. For help finding rooms email Veronique Thibault (vthibau@uky.edu).
- (5) **Doctoral candidates must request scheduling of the final defense date with the Graduate School at least two weeks before the date desired** using the *Request for Final Doctoral Examination* form: https://ris.uky.edu/cfdocs/gs/DoctoralCommittee/Selection_Screen.cfm. An acceptable copy of the dissertation must be presented to all members of the Advisory Committee and the Graduate School at this time. The draft must be complete in content, including all footnotes, tables, figures, and appendices. A full bibliography or set of references must be included, along with a title page and abstract.
- (6) After the Final Examination is passed, the final copy of the dissertation is prepared. Final copies are submitted to the Graduate School along with the signature of the Dissertation Advisor and the Director of Graduate Studies.
- (7) The dissertation in its final form must be received in the Graduate School office **within 60 days of the Final Examination**. *If this deadline is not met*, the Candidate must undergo a second examination.

Cancellation of a Final Examination (<http://ukgrad.askadmissions.net/ask.aspx>):

A Final Examination may be canceled prior to its official start for substantive reason with no permanent consequences for the student. The student has not failed the examination in this case because it was never officially begun. Substantive reasons can include a missing committee member, a sudden difficulty in the candidate's personal life that may affect performance, or a (late) opinion on the part of one or more committee members that the dissertation is not ready to defend. In such cases, the committee may hold an open or closed discussion to review the issues at hand and reach a decision on whether to hold the examination or not. Furthermore, the candidate does have the right to cancel the examination before it begins. If the examination is canceled, it must be formally rescheduled with the Graduate School in the standard fashion. A minimum two-week interval is required for re-scheduling the examination.

G. GENERAL TIMELINE FOR DEGREE PROGRAM

Before the First Semester

1. Meet with the Director of Graduate Studies and develop a coursework plan for the first semester and a preliminary plan for the rest of your program.
2. Attend the new student orientation.

First Year

1. The number one priority for your first semester is to do well in your courses.
2. Perform laboratory rotations, if applicable. By the end of the first year, you will need to identify an Dissertation Advisor who can support your graduate stipend.
3. Submit Individual Development Plan (IDP) at the end of the academic year.

Second Year

1. Continue to do well in your courses.
2. Work on your research project.
3. Form an Advisory Committee, in consultation with your Dissertation Advisor, by the beginning of your second year.
4. In the second semester of your second year, you will need to present a seminar in the Department of Pharmacology and Nutritional Science seminar series (NS 771).
5. By the end of your second semester of your second year, have a committee meeting that sets a timeline for your qualifying exam. Advisory Committee meeting minutes should be sent to Ms. Veronique Thibault (ythibau@uky.edu) and the Director of Graduate Studies within a week of the meeting (a template for this is in the Appendix).
6. Submit IDP at the end of the academic year.

Third Year

1. Take and pass your qualifying exam.
2. Work on research project.
3. Meet with Advisory Committee; email meeting minutes to the Director of Graduate Studies and Ms. Veronique Thibault.
4. Submit IDP at the end of the academic year.

Fourth and Subsequent Years

1. Work on research project.
2. Present your research once per year in the seminar series (NS 771).
3. Meet with your Advisory Committee at least once per year; email meeting minutes to the Director of Graduate Studies and Ms. Veronique Thibault.
4. Submit IDP at the end of each academic year.

Final Semester

1. File Application for Degree with the Graduate School: An Application for Degree must be filed with the Graduate School via MyUK within 30 days after the beginning of the semester. Go to the following website: <https://myuk.uky.edu/irj/portal> After logging in, click on Student Services / myRecords / Graduate Degree Application.
2. The procedures for preparing your dissertation and scheduling your final exam are listed above in the Doctoral Dissertation and Final Exam sections.

ACADEMIC TOPICS

Research Assistantships

Candidates for a Ph.D. are required to [apply for a Research Assistantship](#), which represents an integral part of the Ph.D. program.

Outside Employment

- Research Assistantships are considered to be full-time positions. Outside employment is strongly discouraged if it appears to interfere with a student's ability to handle their coursework, current workload, or timely progress to degree.
- Students are not allowed to have additional, outside employment *within UK* unless approved ahead of time. To obtain approval for other employment at UK, an Overload Request Form (<http://gradschool.uky.edu/sites/gradschool.uky.edu/files/Forms/StudentForms/Overload%20Request%20Form.pdf>) must be submitted to the Director of Graduate Studies, who will then submit to the Graduate School after consulting with the student's Ph.D. Advisor.
- International students are not allowed to have outside employment.

Research Integrity

- All biomedical research in the Division of Nutritional Sciences follows strict federal, state, and university mandates concerning research protocols, use of laboratory animals and research involving human subjects.
- The Office of Research Integrity (ORI) at the University of Kentucky both supervises and monitors adherence to these mandates. <http://www.research.uky.edu/ori/>
- The ORI also supports the institution in promoting ethical conduct of research and educating UK students and employees regarding research misconduct regulations.
- Students must adhere to all approved protocol and procedures set forth by their Dissertation Advisors.

Honor Code/Plagiarism

- Pursuit of a graduate degree in Nutritional Sciences constitutes an agreement to adhere to high standards of honesty and ethical behavior.
- Cheating, plagiarism, and any scientific misconduct such as falsification of data or deliberate misuse of equipment may result in dismissal from the program.
- Procedures outlined in the UK Student Code will be adhered to with respect to a charge of misconduct. <http://www.uky.edu/StudentAffairs/Code/part1.html>

Health Care Colleges Code of Student Professional Conduct:

<http://www.uky.edu/regs/files/HCCcode.pdf>

Evaluation of Academic Performance and Progress Towards Degree

The Graduate School requires each program to annually review whether a student is making good progress towards their degree. The Provost's office also has specific requirements for student assessment. Students will receive an Annual Review of Standing in the PhD program at the end of each academic year from the Director of Graduate Studies (a copy of the Annual Review of Standing form is included in the Appendix). This section provides guidelines to be used in the unusual circumstance that the department must consider dismissal of a graduate student for academic or professional reasons. From [University of Kentucky Administrative Regulations 5:2](#), "Teaching, research and graduate assistants will maintain satisfactory academic records and progress toward degrees. If their academic progress is unsatisfactory, their assistantships may not be renewed".

It is anticipated that every student will be able to fulfill the requirements for a PhD within a reasonable timeframe. It is each student's responsibility to arrange a meeting with his/her Dissertation Advisor and Advisory Committee at least once per year to formally evaluate academic and research progress. Minutes from Advisory Committee meetings should be submitted to the Director of Graduate Studies (template form for meeting minutes is in the Appendix). Student progress is also assessed based on the Individual Development Plan (IDP) form, to be completed annually by doctoral students and signed by their Dissertation Advisors.

Procedure for addressing issues raised by students or advisors

During graduate study, if a student or Dissertation Advisor encounters an issue that cannot be resolved, he/she should meet with their Advisory Committee. If the issue remains unresolved, the student and/or Major Advisor should contact the Director of Graduate Studies. If warranted, the Director of Graduate Studies will assemble an *ad hoc* Student Committee after consulting with the department Chair. This committee will typically include the Director of Graduate Studies, the Director of Education for DPNS, and a few departmental faculty members at large. The purpose of this committee is to assess the situation and make recommendations to the department Chair and/or Dean of the Graduate School as appropriate. The student will always have the opportunity to represent themselves during *ad hoc* Student Committee deliberations.

Transfer to a different laboratory

It is by mutual consent that a graduate student carries out dissertation research in the Dissertation Advisor's laboratory. Dissertation research can be terminated if desired by either the Dissertation Advisor or student. If during the course of a graduate student's program, the student wishes to change to a different Dissertation Advisor but continue in the degree program, or the Dissertation Advisor wants to resign being the Dissertation Advisor, the Director of Graduate Studies must be notified. If the student is in good academic standing, the Director of Graduate Studies will advise the Department Chair, who will decide regarding continuation of support. *Students may not receive support if they do not identify mentors within the faculty of the Department of Pharmacology and Nutritional Sciences.* The department cannot guarantee placement or continued support for an indefinite period of time. If the student is unable to identify a new Dissertation Advisor within the stipulated period, the student may be considered for dismissal due to a failure to progress toward degree.

Reasons for dismissing a student from the PhD program include the following:

- Scholastic probation: When students have completed 12 or more semester hours of graduate course work with a cumulative GPA of less than 3.0, they will be placed on scholastic probation. Students will have one full-time semester or the equivalent (nine hours) to remove the scholastic probation by attaining a 3.0 cumulative GPA.
- Failure to identify a Dissertation Advisor (following rotations or lab transfer)
- Failure to pass the qualifying exam on the second attempt.
- Student misconduct:
 - Plagiarism on class assignments or exams, or on the qualifying exam or dissertation.
 - Academic cheating, falsification of research data, or misuse of University equipment or grant funds.

- Excessive and unexcused absenteeism.
- Harassment of departmental personnel.
- Violation of the Code of Student Conduct (<http://www.uky.edu/StudentAffairs/Code>).
- Failure to make adequate progress towards a doctoral degree as determined and documented by an unsatisfactory grade “UN” for 767 (Dissertation Residency Credit)

The process for addressing inadequate progress towards degree:

- The Dissertation Advisor should notify the Director of Graduate Studies in writing about the student’s unsatisfactory performance, with documentation from a committee meeting, written comments on an IDP, or written correspondence with the student.
- Students, in collaboration with their Dissertation Advisor and Advisory Committee, will devise an action plan to improve productivity, address shortcomings and include a timeline to meet outlined goals. The action plan will be agreed upon and signed by the student, the Dissertation Advisor, and the Director of Graduate Studies.
- The Advisory Committee will reconvene at an agreed upon date and time (within 6 months of the action plan being filed) to receive an update on student progress, at which point, if issues are not resolved, a recommendation for dismissal may be submitted in writing to the Director of Graduate Studies.

The process for student dismissal:

- A student’s Advisory Committee and/or Dissertation Advisor may recommend termination at any time prior to the Qualifying Examination, after the student has failed to pass one Qualifying Examination, or after the Qualifying Examination has been passed. The recommendation must be in writing to the Director of Graduate Studies with a copy to the student. The letter should clearly document the reasons for the recommendation.
- At the recommendation of a student’s Advisory Committee and/or Dissertation Advisor, the Director of Graduate Studies will assemble an *ad hoc* Student Committee as described above. The purpose of this committee is to assess the situation and make recommendations to the department Chair and/or Dean of the Graduate School as appropriate. The student has the option to present his/her case at this time.
- A student may be dismissed from the Graduate School via a recommendation of the Dean of the Graduate School to the Provost.

The process for student appeals [From Administrative Regulations 5:2]:

If the student believes that the department’s decision to terminate the teaching or research assistantship is in error, they may appeal the ruling to the Graduate Council within 15 days of the notice of non-reappointment. A delegated subcommittee of at least five (5) members of the Graduate council will consider the appeal, request further information from the student or the education unit if necessary, and issue a written response to the student within 45 days of the appeal being filed. If the student believes that the termination is the result of a violation of established procedure or academic freedom, the student may file a complaint with the Senate Advisory Committee on Privilege and Tenure, in accordance with the procedures outlined in Section 1.4.4.2 of the University Senate Rules (AR 5:2.C,D). Under Governing Rules GR XI, the University Appeals Board (UAB) can take appeals if the

student alleges a violation of student rights, and the UAB has jurisdiction over “final decisions of University hearing agencies in which a student alleges a violation of student rights.”

MISCELLANEOUS TOPICS

Communication Skills

- The development of good communication skills is a vital part of graduate education. These skills are improved through a wide range of activities including seminar courses, journal clubs, teaching experiences, the writing of manuscripts, research proposal and grant applications, presentations at local, regional and national meetings, as well as the final dissertation.
- Proficiency in English is required of all graduate students in the Nutritional Sciences program. English as a Second Language classes are available to the Division’s students. Please contact the Student Coordinator for further information.

Research Presentations

Students are encouraged to present research data at national/international professional meetings such as those organized by the Federation of American Societies for Experimental Biology (FASEB), American Society of Nutrition, American Association for Cancer Research, American Heart Association, Society for Free Radical Biology and Medicine, American College of Nutrition, American Diabetes Association, Society of Toxicology, and Institute of Food Technologists. These meetings provide an opportunity to interact with peers, faculty and others with common interests.

Student Travel Support Requirements

Support for professional travel to meetings and conferences is available through the College of Medicine, the Graduate Student Congress and sometimes through the Department of Pharmacology and Nutritional Sciences. Please refer to this student travel document linked to our department website for more information:

https://drive.google.com/file/d/1iwD8fun7_K4bvveA98p9ryLMrotEXvnR/view?usp=sharing

Please note that students are eligible for travel awards to present a research paper or abstract, not for attendance alone. Also, contact your current Graduate Student Congress representative for information about Awards for Travel, Research and Service.

Support for travel to a professional meeting will be provided only when a research paper is to be presented. An application must be completed and accompanied by the following documents:

- An abstract of the paper to be presented
- A copy of the invitation to present or a program confirmation card (a copy of the meeting program with the student’s name listed as a presenter).
- An itemized budget of expenses.
- Students must acknowledge the “Division of Nutritional Sciences” as their affiliation when presenting a paper with slides or a poster.

Vacations and Holidays

New students should be aware that graduate school differs from undergraduate study in that graduate work is a full-time endeavor throughout the 12 months of the year. In general, students are expected to be in lab during the workweek when not in class or studying. Students should also be aware that time-sensitive scientific research can often require work on holidays, weekends, and nights. The department recommends the following guidelines for planning time off:

- Students on Research Assistantships should be allowed two weeks of vacation per year in addition to holidays approved for all staff at the University of Kentucky.
- Fall and Spring Breaks are **not** breaks for students on assistantship; the Christmas/New Year holiday usually falls between December 25th and January 1st.
- Effective communication between students and their advisors before vacation times is in everyone's best interest.
- RA's must submit a UK Absence Record, signed by both the student and the advisor for all travel, sick, and vacation time. These records will be maintained by the departmental administrator.

Student Recruitment

Students may be requested to assist the department in recruiting new students or orienting them to the NS and IBS programs. This may include attending lunches and question/answer sessions, or by giving tours or demonstrations at the request of the Chair or Director of Graduate Studies.

Personal Safety

Students should always consult with a faculty member before using new equipment, toxins, chemicals or infectious agents. Students should also be aware that the University requires specific safety training before using various methods and equipment. The following is a partial list of University web pages where you can register for specific training classes or review appropriate safety manuals.

- Blood Borne Pathogens: <http://ehs.uky.edu/classes/>
- Chemicals and Lab Safety: <http://ehs.uky.edu/classes/>
- Hazardous Waste: <http://ehs.uky.edu/classes/>
- Lab Animals: <https://www.research.uky.edu/division-laboratory-animal-resources/training>
- Laser Safety: <http://ehs.uky.edu/classes/>
- Radiation Safety: <http://ehs.uky.edu/classes/>
- Additional safety information: <http://ehs.uky.edu/>

Keys

Requests for lab or equipment room keys must be approved by your research advisor and departmental chair. Key forms are obtained from the departmental administrator.

Photocopier Privileges

Students may use the departmental photocopier for either research or academic, but not personal, use. An access code may be obtained from the departmental administrator.

E-Mail

All Nutritional Sciences Ph.D. Students are required to activate their UK e-mail addresses. All correspondence from the Department as well as from the departmental staff will be communicated only through the UK e-mail system.

Appendices

- Template for committee meeting minutes
- Qualifying exam assessment form
- Seminar evaluation form
- IDP (Individual Development Plan) form

ADVISORY COMMITTEE MEETING MINUTES



Date:

Student name:

Committee members in attendance:

Accomplishments/ Progress Report/ Concerns:

Next steps/ Action items (with timeline):

Next committee meeting (scheduled):

Minutes approved by (Chair of Committee):

Name: _____

Ph.D. N.S. Qualifying/Final Exam Assessment Form

Student:

Date of Exam:

Committee Member Name:

Learning outcomes	Excellent 4	Competent 3	Marginal 2	Deficient 1	SCORE
1. Able to effectively synthesize and communicate nutrition knowledge	Articulates intimate understanding of nutrition principles and is able to orally communicate and defend new ideas, thinks effectively on his/her feet, is able to integrate knowledge from multiple disciplines and experience in solving problems.	Has appropriate understanding of nutrition principles and is able to adequately communicate and defend new ideas, thinks well on his/her feet, is able to integrate most knowledge from multiple disciplines and experience in solving problems.	Has a basic understanding of nutrition principles but lacks depth, can answer basic questions but has some difficulty thinking on his/her feet, has some gaps in knowledge base and does not effectively use this for problem solving.	Lacks understanding of nutrition principles and is unable to communicate effectively, has substantial gaps in knowledge base and is unable to draw from different areas or experiences to solve problems.	
2. Able to communicate effectively through scientific writing.	Demonstrates a thorough understanding of context, audience, and purpose of the scientific work; uses appropriate, relevant, and compelling content to convey the contribution to the scientific discipline; pays detailed attention to and successful execution of conventions particular to grant writing including organization, content presentation, formatting, and style; uses relevant and credible references appropriately, uses graceful language that skillfully communicates meaning to readers with clarity and fluency, and is nearly error free.	Demonstrates adequate consideration of context, audience and purpose of the scientific work; uses appropriate, relevant and compelling content to convey the contribution to the scientific discipline; consistently uses important conventions particular to writing grants including organization, content presentation, and style; consistently uses appropriate references to support ideas; uses straightforward language that generally conveys meaning to readers with few errors.	Demonstrates awareness of context, audience, and purpose of the scientific work; uses appropriate and relevant content to explore ideas through most of the work; follows expectations appropriate to grant writing for basic organization, content, and presentation; attempts to use credible and/or relevant references to support ideas; uses language that generally conveys meaning with clarity, though with errors	Demonstrates minimal attention to context, audience, purpose of the scientific work; uses appropriate and relevant content to develop simple ideas in parts of the work; attempts to use a consistent system for basic organization and presentation; attempts to use sources to support ideas; uses language that sometimes impedes meaning because of errors in usage.	
2/3. Able to critically analyze literature related to the project, think intellectually about the direction of the project, demonstrate intellectual curiosity about the project.	Demonstrates a thorough understanding of content and scientific context. Uses appropriate and relevant sources to explore ideas within the discipline and to critically develop a well-articulated scientific theme. Clear demonstration of independent intellectual contribution, creativity, and original thinking.	Demonstrates an adequate understanding of content and scientific context. Uses appropriate and relevant sources to critically develop a scientific theme. Follows and presents literature reasonably well. Demonstrates some insight and creativity.	Demonstrates awareness of content and scientific context. Uses appropriate and relevant sources that are applied through most of the work. Organization of ideas not always logical or consistent with composing a scientific argument. Minimal evidence of original thinking.	Demonstrates minimal awareness of content and scientific context. Uses appropriate and relevant sources to develop limited areas of this work. Examples of inappropriate literature citations common. Frequent lapses of logic when composing a scientific argument. Lack of creativity or original thinking.	
3. Able to effectively orally communicate data and interpretation with scientific peers, answers questions, communicates ideas	Articulates intimate understanding of the project, is able to orally communicate and defend new ideas, thinks effectively on his/her feet, is able to integrate knowledge from multiple disciplines and experience in solving problems.	Has appropriate understanding of the project, able to articulate ideas but lacks some creativity, can think through basic problems when questioned, has an adequate knowledge base and is able to integrate appropriately to solving problems.	Has a basic understanding of the project but lacks depth, can answer basic questions about the project but has some difficulty thinking on his/her feet, has some gaps in knowledge base and does not effectively use this for problem solving.	Lacks understanding of the project and unable to communicate rationale for interpretation of data or direction of the project, substantial gaps in knowledge base and is unable to draw from different areas or experiences to solve problems.	

PHARMACOLOGY AND NUTRITIONAL SCIENCES

Student Seminar Evaluations Form

Student's Name: _____

Today's Date _____

Evaluator's Name (Optional): _____



Are you Faculty? (Circle one) YES or NO

Scoring Scale	(Use this scale to fill out the table below)
Exemplary (Far above standards)	5
Proficient (Above standards)	4
Competent (Meets standards)	3
Developing (Below standards)	2
Beginning (Far Below standards)	1



Outcomes	Criteria	Score
Knowledge	<ul style="list-style-type: none"> • Demonstrates appropriate level of knowledge in chosen discipline • Explains background material relevant to research • Demonstrates knowledge and preparation during Q & A 	
Critical Thinking	<ul style="list-style-type: none"> • Demonstrates ability to critically analyze scientific literature • Demonstrates ability to formulate novel hypotheses and describe experimental design(s) • Describes conclusions, limitations and future directions 	
Communication	<ul style="list-style-type: none"> • Student spoke clearly and audibly throughout the presentation and Q & A • Presentation was well-practiced and presented with confidence • Presentation content was highly organized, logical and effective • Student held eye contact with the audience and made appropriate use of pointer 	
Audio/Visual	<ul style="list-style-type: none"> • Number of slides were appropriate for the time allotted • Slide figures and text were proofed and legible • Data and figures from alternate sources were appropriately cited 	
Additional Comments		

Individual Development Plan (IDP) Form - 2019
Pharmacology and Nutritional Sciences

Graduate Student Name: _____

Ph.D. Program in: Pharmacology Nutritional Sciences (Please ✓ either box)

 Pre-quals Post-quals (Please ✓ either box)

Advisor's Name: _____

Parts I, II and III – to be completed by the student
Part IV – to be completed by the Advisor and Student

I. Annual Progress Report (March 1, 2018 – March 1, 2019)

1. List academic achievements (e.g., courses, workshops, journal clubs) completed from March 1 2018 to now):

2. List or briefly describe major research accomplishments this year (do not include publications or presentations here; instead, describe new techniques or areas of expertise):

3. List references for publications between 3/1/18 and 3/1/19. (Use PubMed to search, and then paste).

Example:

- 1) [Heterozygous loss of TSC2 alters p53 signaling and human stem cell reprogramming.](#)
Armstrong LC, Westlake G, Snow JP, Cawthon B, Armour E, Bowman AB, Ess KC.
Hum Mol Genet. 2017 Dec 1;26(23):4629-4641. doi: 10.1093/hmg/ddx345.
PMID: 28973543

4. List references for abstracts that were presented at conferences or meetings:
 - a. Example: - Title of abstract, Authors, name of conference, date of conference (mm/yy).
City, State, Country

5. List funding/grants applied for and/or received this year.

Individual Development Plan (IDP) Form - 2019

6. List honors and awards received this year (Name of the award, Date received):

7. Within the last year, have you established new research collaborations (intellectual or technical)? If so, please briefly describe. If you have continued collaborations from last year, please briefly describe.

8. List the efforts you have made this year to improve understanding of responsible conduct of research (i.e. conflicts of interest, data ownership/sharing, responsible authorship, etc.):

9. Describe any professional development activities and/or accomplishments over the past year. (e.g., teaching, clinical work, university and departmental service, etc.):

10. Are you satisfied with your progress (academic and/or research) in the past year? Did you reach the goals set for yourself last year? If not, why not?

11. Are you satisfied with current opportunities for career/professional development? If not, why not? Is there anything the department or university could provide that would enhance your graduate education?

II. Plans for Upcoming Year

1. List your academic plans for the upcoming year (e.g. courses you will take or journal clubs you will participate within)

2. List your research project goals for the upcoming year, including anticipated completion dates (be brief):

3. Do you plan to learn new research techniques in the upcoming year? If so, please list.

4. Do you plan to submit publications in the upcoming year? If so, please list, with prospective titles and anticipated submission dates.

5. Do you plan to submit grant or funding applications within the upcoming year? If so, please list.

Individual Development Plan (IDP) Form - 2019

6. Do you plan to establish research and/or intellectual collaborations in the upcoming year? If so, please describe.
7. What are your plans for other professional training in the upcoming year (e.g., teaching, workshops, etc.)? Please list here.

III. Career Goals

1. What are your short- and long-term career goals? What is your plan and/or timeline for achieving them? Are you participating in activities to help you meet these goals?
2. Have you identified and fostered relationships (networking) with mentors other than your PI in similar careers?
3. When do you anticipate beginning a job search? If you are unsure, please estimate.

