PROGRAM OVERVIEW

The Molecular Pharmacology Training Program (MPTP) trains doctoral candidates in molecular and biochemical pharmacology. We emphasize pharmacology and drug discovery in 5 major areas: Cancer Signaling Pathways and Targets; Structural Biology, Bioinformatics and Drug Design; Receptor Pharmacology and Therapeutics; Development of Therapeutics; Pharmacology of Neurodegenerative Disorders. Research experience may be acquired in the following areas: growth-factor mediated signal transduction in mammalian and model organism systems; tyrosine kinase receptors; genomic stability; transcriptional regulation; steroid/nuclear hormone receptors; toxicology; proteomics; protein structure; computational biology and in silico modeling for drug discovery.

Our 46 program faculty are internationally recognized, well-funded scientists and the Chronicle of Higher Education has ranked our program among the top ten Molecular Pharmacology Graduate Programs in their Faculty Scholarly Productivity Index. Our faculty has an extensive track record in training Ph.D. and M.D./Ph.D. students and our program is the recipient of a prestigious NIH Predoctoral T32 training grant. Relevant courses are offered in: Pharmacology and Drug Development; Principles of Protein Modifications in Health and Disease; Bioinformatics and Biostatistics for Biologists; Molecular Biophysics; Cellular Neuroscience; Developmental Biology; Cellular and Molecular Biology. We have a programmatic Annual Retreat for students and mentors to share their research discoveries with the entire community. Students are carefully tracked by the Director and Graduate Advisor, and we currently enjoy a fast time to degree (~5 years).

Director:
Erika Bach, Ph.D. - email: erika.bach@nyumc.org - Ph: 212-263-5963

Graduate Advisor:
Gregory David, Ph.D - email: gregory.david@nyumc.org - Ph: 212-263-2926

Program website: http://biomolpharm.med.nyu.edu/education/

APPLYING FOR ADMISSION TO SACKLER:
The online application opens in September. See http://sackler.med.nyu.edu/graduate/

Students are selected for interviews in late December, interviews occurs in January, February and March. Notification of admission typically occurs within 2 weeks of interview. Decisions on acceptance must be made by April 15.

1ST YEAR:
Orientation: occurs in mid-August and is orchestrated by the Sackler Institute of Graduate Biomedical Sciences (not the MPTP).

1st Year Guides: The MPTP offers "1st Year Guides" to incoming 1st year students. The Guide will meet with one student early in the Fall semester (i.e., August) and then again in the Fall and following Spring. The 1st Year Guide is a MPTP faculty mentor with whom the student is unlikely to do a rotation. The Guide is someone who can offer the student unbiased guidance on rotations, classes, other issues.

Rotations: 1st year students rotate in 3 labs, one rotation occurs in the Fall Semester, one in the Spring Semester and the third in the Spring Semester and early summer. Most students make a choice of a thesis lab in July, at the end of their 1st year.

Classes: MPTP students are required to take these courses:

- Foundations I (Biochemistry and Molecular Biology) (Fall course)
- Scientific Methods: Survival Techniques (Fall course)
- Biostatistics and Bioinformatics for Biologists (Fall course, can be taken in Year 1 or Year 2)
- Scientific Integrity & Responsible Conduct of Research (Spring course)
- Pharmacology and Drug Development; Principles of Protein Modification in Health and Disease (Spring course, can be taken in Year 1 or Year 2)
- Principles of Protein Modifications in Health and Disease (Spring course, can be taken in Year 1 or Year 2)
- Seminar in Pharmacology/Work-in-Progress (Pass/Fail, starting in Year 2 until graduation)

All Sackler students must take 32 credits in course work and so in elective courses must be taken. The choice of elective courses depends upon the interests and thesis work of the student. Recommended elective courses include:

- Molecular Mechanisms in Biology
- Molecular Oncology
- Stem Cells
- Introduction to Neuroscience

2nd Year: The student has joined a mentor's lab and is performing experiments related to her/his thesis research. The student finishes course requirements and attains 32 credits in course work. At the end of the second year (in the summer between Years 2 and 3), it is recommended that the student form her/his thesis committee and write and defend the Thesis Proposal (See below "Qualifying exam"). Students in the Molecular Pharmacology training program must attend the annual
programmatic retreat, usually held in the Spring.

3rd Year and beyond: The student must take her/his qualifying exam by Dec 31 of the third year in graduate school. Either the student has completed this in the summer between Years 2 and 3 or s/he takes the exam in the Fall of Year 3. The student continues training in her/his thesis lab. The student must meet with her/his committee twice a year (every 6 months). It is encouraged that in Year 3 - graduation the student attends national/international conferences and has poster or oral presentations at these events. The student is also expected to attend the numerous excellent seminars at NYU Langone Medical Center. Finally, all MPTP students must have a peer-reviewed paper accepted for publication prior to her/his thesis defense (see below). The student will begin to write her/his thesis and schedule a thesis defense after approval by the thesis committee (see below).

Work-in-Progress

In addition to bi-annual thesis committee meetings, all MPTP students beginning in Year 2 must present their doctoral work once a year in our Work-in-Progress Forum. These meetings run from 1-2 pm (with lunch) on Tuesdays. All MTP students must attend WIP, which is a pass/fail 1 credit course for which Erika Bach is the Course Director – there will be a sign-in sheet. 80% attendance at WIP is required to receive a passing grade.

Annual Retreat

The MPTP has an annual programmatic retreat in the Spring that typically has a keynote speaker, short talks by MPTP students and postdocs in MPTP mentor labs and a poster session. All MPTP must attend this retreat, which is designed to be an enjoyable exchange of ideas and results within the community.

QUALIFYING EXAM

What does the qualifying exam consist of?

The qualifying exam consists of writing one NIH-style proposal and defending it in front of a thesis committee. It is also called the Thesis Proposal, and it must relate to your thesis work.

When should I take the qualifying exam?

The exam must be taken before the end of the 5th semester (for Ph.D. students) or 3rd semester (for MSTP students) of graduate school. In other words the exam must be taken by December 31 of the 3rd year in graduate school, i.e., during the 2nd year in your advisor’s laboratory. Exceptions to this deadline will be granted only in the case of medical or personal emergency/need but not because the student did not start the process with sufficient time. Students are urged to begin the
Qualifying Exam process in the summer at the end of their Year 2 of graduate school: do not wait until the Fall of Year 3 to begin the process. It takes significant time and effort to prepare the written proposal and the oral defense. Furthermore, it is difficult to schedule all of the members of your thesis committee to be in one room at the same time for the Qualifying Exam: DO NOT WAIT UNTIL THE LAST MINUTE AS YOU WILL NOT BE ABLE TO ADHERE TO THE DECEMBER 31 DEADLINE.

In order to be eligible to take the qualifying exam, students must take all required Molecular Pharmacology courses, in addition to meeting the Sackler requirement of obtaining 32 course credits in total (research and seminar do not count towards this total) with a minimum 3.0 GPA. If a student has 1 or 2 credits remaining in the Fall of their 3rd year, which they anticipate to complete by taking a Readings course, the student can take the qualifying exam with the permission of the MPTP graduate advisor.

1) The Qualifying exam must be taken by December 31 of the 3rd year in graduate school. Students who have not done so by December 31 will be placed on academic probation for the Spring semester of their third year. These students will receive a directive from Sackler to schedule the exam within 6 months. Students who have not passed their qualifying exam by the end of their third year will be terminated from the program.

2) Students who fail to meet with their committee at least once a year will be placed on academic probation. Failure to schedule a meeting after a semester on probation will result in termination from the program.

3) Timeline for graduation. Students entering their 5th year of graduate school must submit, with the assistance of their committee, a timeline for completion on the thesis committee report. With the reality that some students do stay on into their 6th year, this form must be updated if students enter the 6th year. It should be noted that NYUSoM housing is guaranteed for only 6 years.

4) Sackler students entering a thesis lab must sign a “document” with his/her mentor. The agreement is not legal but is intended to be an ethical document between the mentor and the student to work as best they can to promote the student’s educational and research objectives. This agreement will be distributed by Sackler to students at the end of their first year, when they have chosen thesis labs. Sackler has not decided if this will contract will be retroactively applied to more senior students. (Note: MD/PhDs have their own form).

5) Thesis committee members who decide that a Sackler student is ready to write and defend his/her PhD must submit a signed “permission to defend form” documenting how the student has produced a significant body of work such that s/he can now complete his/her doctoral training. This document must be signed by the student and all members of the thesis committee. The original document must be given to Erika Bach.
6) **Effective September 1, 2011,** all students wishing to defend their thesis must have a peer-reviewed paper accepted for publication prior to her/his thesis defense.

**Who should be on my proposal committee?**

A student’s thesis committee should consist of three Sackler faculty members and your thesis advisor (a total of 4 members). At least one member of your committee (other than your thesis advisor) must be from the Molecular Pharmacology Training Program. Members from other programs will likely be needed to round out your committee. Ideally, the members of your committee should have some knowledge of your field of study. The make up of the committee should be discussed with your thesis advisor.

A student must meet with the Graduate Advisor (Greg David) to review a list of potential thesis committee members for approval. A student **should not** request ask any Sackler faculty to serve on a thesis committee prior to approval by Greg David or Erika Bach. The student must ask one of the committee members to be the Chair of the Thesis Committee, who is responsible for filling out the Thesis Committee Report (see below) and sending it to Erika Bach. The proposal should be handed out at least 2 weeks prior to the thesis defense date (no exceptions).

**Chair of the Thesis Committee:** The Chair will voice the recommendations of the committee and interface with the graduate adviser. The chairperson is responsible for a written evaluation of the candidate’s performance and committee decision. The MPTP Thesis Committee Report file can be downloaded under the Pre-doctoral tab at [http://biomolpharm.med.nyu.edu/education/molecular-pharmacology-training-program](http://biomolpharm.med.nyu.edu/education/molecular-pharmacology-training-program). The committee members and the student should read and approve the evaluation.

**What is the format for the written Thesis Proposal?**

The proposal is modeled after an NIH grant application. It should follow the guidelines indicated below. **Proposals must adhere to these guidelines to be accepted for oral defense.**

Effective August 2014, we now follow the NIH guidelines for F30/F31 predoctoral proposal. The page limit is now 7 pages, 1 for specific aims and 6 for the rest of the required sections. The 6 page limit does not include references. The margins of the document should be 0.5 inches on all sides. The font should be 11 point Arial. Line spacing should be single. Cite published experimental details where applicable in all sections and provide the full reference in the Bibliography. A complete figure legend is expected to accompany each figure. The thesis proposal should be realistic. It should be focused and is expected to include what can be accomplished in a three-year period. Please note that there is no Innovation section.

A. Specific Aims: 1 page
B. Research Strategy.
   1. Significance
a. Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.

b. Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.

c. Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.

2. Approach

a. Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project. Include how the data will be collected, analyzed, and interpreted as well as any resource sharing plans as appropriate.

b. Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.

c. If the project is in the early stages of development, describe any strategy to establish feasibility, and address the management of any high risk aspects of the proposed work.

Pdf copies of successfully defended thesis proposals from other MPTP students are available from Erika Bach (erika.bach@nyumc.org).

To re-emphasize what is written above, for each experiment proposed, the student should discuss the possible outcomes (expected results) and their interpretations. Importantly, the student should discuss difficulties s/he expects to encounter. The student should show that s/he is aware of the limitations of the proposed experimental approaches and suggest potential alternatives if the anticipated results are not obtained. Students should also discuss the priority of experiments to be performed.

The student must email the following to Erika Bach at least 2 weeks prior to the thesis proposal defense date: (1) a copy of your proposal in pdf format (MS Word documents will be not accepted); (2) names of the members of your committee; (3) the date and time of the scheduled oral defense of your thesis proposal.

What is the length of the oral exam and what is expected of the students?

The oral exam should take between 1.5-2 hours, during which time the Thesis Proposal must be orally defended. The student is advised to reserve a conference room for 3 hours. The student should give a Powerpoint presentation that serves to focus the attention of the committee on those aspects that the student feels are most important. The student (and not the mentor) should prepare figures. Remember that poor visuals will detract from the presentation. Students are strongly urged to practice their presentation with their mentors, lab members and colleagues.
During and after a brief introduction and presentation of pertinent preliminary results, the examiners will question the student, attempting to assess the depth of knowledge in the area of the proposal, understanding of the experimental approaches and his/her ability to rationally analyze a problem or issue. Although your advisor will be present during the exam, the candidate is responsible for answering all questions on background, preliminary results and future directions posed by the committee. Your advisor is a silent observer.

**Format of Thesis Committee Meetings**

This student and committee members meet in the reserved room and the student is asked to leave to room for private consultation between the committee and the mentor (~5 minutes). Then the student is brought back into the room and the mentor is asked to leave for a private consultation between the committee and the student (~5 minutes). After this, the mentor is brought back into the room and the student begins the presentation. At the conclusion of the presentation, student is asked to leave to room for private consultation between the committee and the mentor (~5 minutes). Finally, the student is brought back into the room for a discussion/summing up of the student's performance, expectations for the next 6 months and the signing of the Thesis Committee Report.

**How are students evaluated?**

There are three possible outcomes to the qualifying exam that can be recommended by the committee:

- **Pass**: The committee feels that the student has met expectations and passed the exam. Students who pass the qualifying exam can apply for a Masters thesis. See Lisabeth Greene in the Sackler Office for details.

- **Conditional Pass**: The committee feels that the proposal needs improvement. The student will have 4-6 weeks to rewrite the proposal and resubmit it to the committee for approval. No oral exam is required, if the committee approves the rewritten proposal.

- **Did Not Pass**: This has rarely happened to MPTP students. To avoid not passing the exam, students are strongly encouraged to practice the oral defense of their proposals in an audience of peers. Very infrequently, the committee may feel that there are very serious problems with the written proposal and/or oral defense. The committee will consult with the student’s thesis advisor and the graduate student advisor as to whether the student should be given an opportunity to rewrite the proposal. This decision will be based on the student’s prior performance in the program including coursework, rotations, and the evaluation of the student’s thesis advisor. If the student fails the exam and the student has performed adequately in coursework, rotations and has the support of his/her thesis advisor, he/she will be given an opportunity to rewrite the proposal and retake the oral exam a second time within the next 4-6 weeks. Students who fail the exam a second time will be not be allowed to continue in the Molecular Pharmacology Training Program and they are
not eligible for a Masters’ thesis.

**Thesis Update Meetings**

After the student successfully defends his/her Thesis Proposal, s/he must meet with his/her committee **every 6 months** to review the student’s progress and provide guidance. **This means that the student must meet with her/his committee twice a year.** It is the responsibility of the student to schedule these meetings accordingly. Only in the case of medical/personal emergency/need will there be an exception granted for the requirement of meeting with your committee twice a year.

For a thesis “update” meeting, the student must write a short, succinct report (4 pages maximum) documenting the progress that the student has made since the last committee meeting. The student should prepare a Pointpoint presentation (typically ~30-45 minute in length) in which the student documents his/her progress. As before, the student and not the advisor should prepare figures. Pdf copies of progress reports from other MPTP students are available from Erika Bach (erika.bach@nyumc.org). Again a copy of the filled-out and signed MPTP Thesis Committee Report for the thesis update meeting must be given to the MPTP Director (Erika Bach). Again this file can be downloaded under the Pre-doctoral tab at http://biomolpharm.med.nyu.edu/education/molecular-pharmacology-training-program.

In accordance with Sackler rules, if the committee determines that sufficient progress has not been made, the student will be placed on probation for one semester and will be required to schedule another meeting before the end of the probationary period. If sufficient progress is not demonstrated in the second meeting, the student may be asked to leave the program. Progress will be judged by several criteria including: the ability to communicate in a written report and an oral presentation the nature of the experiments performed, place them in the context of current scientific dogma and direction for the future.

**As stated above, students entering their 5th year must submit, with the assistance of their committee, a status report with a timeline for completion.** With the reality that some students do stay on into their 6th year, this form must be updated if students enter the 6th year.

**The MPTP Director must have copies of Thesis Committee Reports for the Qualifying Exam and all Thesis Update Meetings in order to approve the student’s graduation.**

**Thesis Defense**

A student will have at least 2 meetings with his/her thesis committee after the Qualifying Exam and prior to his/her thesis defense. When the thesis committee feels that the student has carried out an important body of work sufficient to defend their thesis, they will recommend that the student begin writing their thesis. For the
oral thesis defense, the student needs to select an additional outside committee member who is not an NYU faculty member.

**Graduate assistant termination and thesis defense (Sackler Policy)**

Within 30 days of their thesis defense, students must either be terminated or, if they will be continuing at NYU, have their title changed from 'Graduate Assistant.' Students will also have to give up their housing 30 days after their thesis defense. Exceptions to this policy may be granted by Dr. Naoko Tanese (in writing).

**Insufficient progress made after passing the Qualifying Exam**

The MPTP guidelines have been designed to help MPTP students defend their PhDs with 6 years of matriculation. Currently, the average time to completion of a PhD at Sackler is ~5 years, as compared with ~6 years nationally. The student’s thesis committee will document in writing the progress made by the student after passing the qualifying exam. **Students entering their 5th year must submit, with the assistance of their committee, a status report with a timeline for completion. This timeline must be updated if the student enters his/her 6th year.** Students entering the 7th year in graduate school without significant progress to be able to defend their thesis will be placed on academic probation. They may also be asked to leave the MPTP if sufficient progress has not been made after one semester on probation.

Note: This file can be downloaded under the Pre-doctoral tab at [http://biomolpharm.med.nyu.edu/education/molecular-pharmacology-training-program](http://biomolpharm.med.nyu.edu/education/molecular-pharmacology-training-program)