

GUIDE TO MD/PH.D PROGRAM AT THE UNIVERSITY OF NEW MEXICO HEALTH SCIENCE CENTER

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This guide describes the organization of the MD/PhD program at the University of New Mexico School of Medicine. It is intended to assist faculty and students to become familiar with the program. The Program Director will be available for discussion and clarification regarding any aspect of the Program.

The contribution of Dr. Rick Lyons (previous director of the MD/PhD program), Karen Schwab and Jocelyn White (previous coordinators of the program) to the preparation of initial drafts of this guide is gratefully acknowledged. The valuable assistance of current BREP administrative personnel (Ignacio Ortiz-Program Manager, Sandy Turner-Program Coordinator and Mary Fenton-Program Coordinator) is also appreciated.

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INTRODUCTION

This guide is to be used a supplement to the:

1. UNM Catalog (<http://www.unm.edu/%7eunmreg/catalog.htm>)
2. UNM Pathfinder (UNM Student Handbook; <http://www.unm.edu/~pathfind/>)
3. Biomedical Sciences Graduate Program handbook
(<http://hsc.unm.edu/som/research/bsgp/currentstudentsfaculty.shtml>)
4. UNM-SOM Student Handbook
(http://hsc.unm.edu/som/oss/current%5Fstudents/cs_handbook.shtml).

These documents contain policies and information that pertain to the student's entering class. Students are expected to review and have a full understanding of the information presented therein. Students are also expected to keep their handbooks throughout their medical school tenure.

The mission of the MD/PhD program is to develop medical scientists with scientific research skills that will allow them to study fundamental questions pertaining to the processes related to human diseases. These individuals will also have the clinical training that will allow them to transfer basic scientific advances to the bedside.

An integrated MD/ PhD program was initiated at the UNM-SOM in the year 2000. This program is designed to provide comprehensive training in both clinical sciences and a basic biomedical discipline. The intent of the program is to provide the student with a cohesive training experience while obtaining the MD/PhD degree. Students participate in activities common to both programs while involved in the medical school curriculum or engaged in PhD dissertation research. Currently the program consists of the first 21 months of the medical school curriculum, followed by 3-5 years of the graduate school curriculum and PhD dissertation research, and concludes with the remaining 2 years of the medical school curriculum. The program is designed to be completed in 7-9 years. The PhD and MD degrees are awarded simultaneously at the end of the entire training period.

Students can pursue many lines of research activity performed by investigators in biomedical research in the School of Medicine. Students choose from research laboratories working in diverse research areas that include:

1. Cancer Biology & Epidemiology
2. Cell Biology & Physiology
3. Development & Stem Cell Biology
4. Immunology
5. Molecular and Biochemical Basis of Disease
6. Molecular Genetics and Genomics
7. Neuroscience
8. Toxicology & Pharmacology
9. Vascular & Respiratory Biology
10. Virology & Microbial Pathogenesis

OVERVIEW OF TRAINING PROGRAM

The goals of the program are to train individuals who have skills in both clinical medicine and can apply the scientific method to basic biological questions that will improve medical care and treatment. The students in this program are guided by the MD/PhD Program Steering Committee. The Steering Committee is made up of the Program Director plus MD, PhD and/or MD/PhD researchers in the medical school.

The Program Director and the members of this committee can be used by the student to assist in making decisions regarding their laboratory rotations and during their transition years from research back to medical school, as well as providing guidance toward long term career planning (residency, post doctoral training, etc). During the research years, the Committee of Studies and Dissertation Committee monitor and advise the students and keep the Program Director informed of progress.

After completing at least 2 laboratory rotations (typically by the end of the first year of Phase-I of medical school), students choose a research advisor. They continue their Phase-I medical school courses and concurrently take some graduate courses. Students then take the USMLE-1 and start working in their laboratories. After completing the graduate core course requirements, students take a Qualifying Exam. Students also choose a faculty Committee on Studies (COS) to help guide them through their dissertation research. After completing advanced coursework and developing their research projects, all students must successfully complete a Comprehensive Examination, which is administered by their COS. At this point, students become PhD candidates. In subsequent years, they complete the laboratory research required for completing their PhD Dissertation. This is done under the guidance of a Dissertation Committee. Most students complete the PhD portion of their studies within 3-5 years. Finally, students complete the last two years of the medical school curriculum (Phases II and III).

Dissertation Advisor

A student's research advisor must meet the criteria stated in the Office of Graduate Studies (OGS) web site (committee guidelines are available as part of the Appointment of Dissertation Committee form, online at <http://www.unm.edu/grad/eforms/committee.PDF>) or the UNM Catalog. The responsibility for the research guidance and progress principally rests with the head of the laboratory in which the student is working. In the event that an advisor leaves the university, students may move with their advisor if they have been in the laboratory for more than two years. In that situation, the advisor would be expected to take responsibility for tuition and stipends of the student while the student remains in the lab. The MD/PhD program would resume financial responsibility once the student has finished the research portion of the program and is re-enrolled back into the University of New Mexico Medical School.

Duration of Training

The MD/PhD strongly encourages students and mentors to develop the training over a 7-8 year period, with the possible addition of an additional year to complete dissertation research. Students and their mentors should consult with the Program Director as early as possible if the student's progress is slower than anticipated. If in the rare circumstance that the student's program will take more than eight years, the student and his or her mentor must petition the Program Director for an extension.

TIMETABLE OF MD/PhD TRAINING

DATE	COMMENTS
Summer prior to Year 1	<ul style="list-style-type: none"> • Potential for rotation #1 (Biomed 506) • Orientation in August
Year 1	<ul style="list-style-type: none"> • Phase I-1 • Biomed 501- Fundamentals for Grad research • Biomed 530 -Friday Noon Seminar CMBD • Biomed 506-Lab Rotation 1 & 2 (during summer at the end of year 1) • If possible, choose dissertation advisor
Year 2	<ul style="list-style-type: none"> • Phase I-2 (Fall) • Biomed 507 or 508-Advanced Cell & Molecular Biology (Fall) • Final rotation if needed/ final selection of dissertation advisor (Biomed 506-Early Spring) • Prepare for USMLE-1 and take it by end of March • Biomed 530-Cell and Basis of Disease Seminar • Take Biomed 509, 510, 514, 515, 516 or 522 selective course (3 credits) (Spring) • Start research (Biomed 695-Late Spring)
Year 3	<ul style="list-style-type: none"> • Continue research (Biomed 695). Fall and Spring • Take advanced coursework as needed (i.e. Biomed 555-Bioethics, seminars, short courses, etc.). • Biomed 507 or 508-Advanced Cell & Molecular Biology (Fall) • Biomed 525 Cell and Molecular Basis of Disease Journal Club (Fall) • Qualifying exam (January) • Form Committee of Studies
Year 4	<ul style="list-style-type: none"> • Submit predoctoral fellowship • Comprehensive Exam (Summer-Fall) • Take advanced coursework as needed • Dissertation research (Biomed 699)
Year 5-6	<ul style="list-style-type: none"> • Dissertation research (Biomed 699) • Defend dissertation; submit Report of Final Examination for Doctorate plus memo from Program Director regarding graduation procedures • Re-enter medical school curriculum in May (Phase II)
Year 6-7	<ul style="list-style-type: none"> • Complete Phase II • Take USMLE-2 (May-June)
Year 7-8	<ul style="list-style-type: none"> • Phase III starts • Residency applications/interviews • Additional research • Complete Medical School Teaching requirement. • Submit dissertation to OGS by deadline published in catalog. • Graduation (in May)

DETAILED DESCRIPTION OF THE TRAINING PROGRAM

First summer

In some cases, students may choose to begin their lab rotations in July of their first summer in order to expedite the research process. The Program Director and the Steering Committee will be available to assist in their lab rotation selections. Prior to initiating their laboratory rotations, students will receive their appropriate compliance and safety training.

Year 1-Phase I-1

In August of their first year, students will begin Phase I of the UNM School of Medicine curriculum. This curriculum is based on problem-based learning and is an internationally recognized education program.

Phase I will be composed of 5 sequential blocks linked to ongoing curricular components. Units 1-4 are completed in the 1st year (August-June):

- Human Structure, Function, and Development (10 weeks)
- Genetics and Neoplasia (5.3 weeks)
- Infection and Immunity (5.1 weeks)
- Neuroscience (8 weeks)
- CV/Pulmonary/Renal (10 weeks)

The sequence and duration of the units is subject to change. Students must consult the school of medicine web site (<http://hsc.unm.edu/som/education/ume/Students.shtml>) and click on the curricular map that corresponds to their entering class.

Students will participate in *Fundamentals for Graduate research (Biomed 501-002)*. This course provides first year MD/PhD students with information for making an educated choice of a dissertation research advisor, of various teaching and research resources and facilities, communications skills, introduction to responsible conduct of research and other topics. Students will also attend *Biomed 530-Cell and Molecular Basis of Disease Seminar*. This seminar is an interdepartmental initiative that features preeminent scientists to speak about their research and offer student exposure to a breadth of internationally recognized research. In addition, all speakers engage with students in informal lunch meetings after their presentations.

Summer at the end of Year 1. During the Fall and Spring of Year 1, the students should have visited laboratories and decided where they will perform their research rotations. Students should select diverse labs for rotations in order to be exposed to the breadth of research in the school. In these rotations, first year graduate students will participate in research with potential dissertation mentors and gain first-hand experience in a variety of techniques and approaches to biological problems. Students must perform a minimum of two rotations (*Biomed 506- Special Topics in Biomedical Research*). The ROTATION AGREEMENT and ROTATION EVALUATION FORMS must be completed (<http://hsc.unm.edu/som/research/bsgp/forms.shtml>). One of these rotations can be completed the summer prior to year 1. However, these are more typically completed during the summer at the end of year 1 (instead of the practical immersion experience-PIE). After rotations are completed, students may choose a dissertation advisor and complete the "MENTOR AGREEMENT FORM" (<http://hsc.unm.edu/som/research/bsgp/forms.shtml>). The Program Director must be consulted prior to the final selection of the mentor.

Year 2-Phase I-2 and Beginning of Ph.D. Program

GI/Nutrition (6.3 weeks)

Endocrinology (4 weeks)

Human Sexuality and Reproduction (4 weeks)

MD/PhD students must also take either Biomed 507 or 508 (whichever best fits their schedule) during Fall semester of this academic year. *Biomed 507 Advanced Molecular Biology*: Advanced topics in modern cell biology including protein trafficking, organelle biogenesis, signal transduction, cytoskeleton, extracellular matrix and muscle. Introduction to the cells of the immune system and to immunological techniques used in cell and molecular biology. *Biomed 508 Advanced Cellular Biology*: Basic principles of nucleic acid structure, progresses through treatments of the major molecular genetic processes, and finally considers control of growth and development.

On April 1st of Year 2, students transfer to the Biomedical Science Graduate Program. At least a month in advance, students must submit a written request to the SOM to be placed on academic leave of absence. The Program Director will also write an official letter to the medical school requesting a leave of absence for completion of the research component of the student's training. Finish rotation the third rotation, if necessary. If they have not done so, the students should choose their laboratory mentors by no later than the end of February of Year 2 and fill the "MENTOR AGREEMENT FORM". Students must also take a 3 credit selective graduate course *Biomed 509, 510, 514, 515, 516 or 522*. Most of these selective courses are offered in the Spring semester only and are a prerequisite to take the qualifying exam. Students must also take the Cell and Molecular Basis of Disease Seminar (Biomed 530).

The USMLE-1 must be taken during the Spring of Year 2. Students will prepare for the test between January-March. Regular MD students prepare for the USMLE-1 between January-February. MD/PhD students are given an extra month since they have to concurrently take a selective graduate class while preparing for the exam. The test should be taken no later than the last week of March. After this, students start working on their research projects.

State laws regarding the time period allowable between the USMLE-1 and USMLE-3 should be noted since it is only seven years in some states (including New Mexico). It is vital that students track this period of time in order to maintain compliance with the laws within their states. They should directly consult with the appropriate state board regarding special exceptions for MD/PhD students.

Years 3-7: Research

The student and his/her research advisor shall choose a COS. The purpose of the COS is to function in conjunction with the research advisor in guiding the student's progress throughout his/her graduate studies. Once the comprehensive exam has been completed, the COS normally continues to guide the student as the Dissertation Committee. Under most circumstances, the research advisor chairs the COS and Dissertation Committee. However, the advisor and members of the committee must fit the criteria established by the OGS (committee guidelines are available as part of the Appointment of Dissertation Committee form, online at <http://www.unm.edu/grad/eforms/committee.PDF>) It is strongly recommended that at least one MD or MD/PhD be a member of the committee. Once the student and research advisor have chosen the COS, the "APPOINTMENT OF COMMITTEE ON STUDIES" form must be immediately forwarded to the Director of the Biomedical Sciences Graduate Program

(<http://hsc.unm.edu/som/research/bsgp/forms.shtm>). Students are responsible for scheduling their committee meetings. The COS must meet with the student at least once every six months. The "REPORT OF COS/DISSERTATION COMMITTEE" form must be filled out and sent to the Director of the Biomedical Sciences Graduate Program immediately after the meeting (<http://hsc.unm.edu/som/research/bsgp/forms.shtm>).

All students are required to enroll in a Divisional Seminar or journal club until graduation. During the research years, all students are required to present at least one talk a year in either a seminar, a journal club, BSGP Research Day, or a scientific meeting. Students will also enroll in *Biomed 695-Research in Medical Sciences* and take advanced coursework as needed (i.e. Biomed 555-Bioethics, seminars, short courses, etc.). Students must complete *Biomed 507 or 508-Advanced Cell & Molecular Biology* (whichever was not taken in Year 2) and *Biomed 525 Cell and Molecular Basis of Disease Journal Club*.

Qualifying Examination

This exam should be taken in January of Year 3, after completion of Biomed 507 and 508. Students must meet with the BSGP office staff 6 months in advance to confirm that they will be eligible to take the test (i.e. all core/selective requirements will be completed). The format of the exam is refined from year-to-year. Therefore, students should meet with the BSGP office staff to gather information at least 2 months in advance of the test date.

Doctoral Dissertation Proposal (Comprehensive Examination)

The purpose of this exam is to examine the student's level of knowledge and the quality of his/her skills in hypothesis formulation, experimental design and deductive reasoning in the defined area of research interest. This exam is a prerequisite for advancement to doctoral candidacy. The following guidelines for the Comprehensive Exam have been approved by the Basic Sciences Faculty of the School of Medicine:

Within 6 months of passing the Qualifying Examination, the student will submit a written proposal of his or her doctoral dissertation research project to his or her COS. In the written proposal the student must 1) discuss the nature of the problem to be investigated including a brief review of previous work in the field and the relevance of the problem to biomedical science; 2) clearly state the hypothesis to be tested; 3) describe the experimental approach to test the hypothesis, including the experimental techniques to be used and the methods to be used in the analysis of the data. At least three weeks prior to the oral examination, the form "ANNOUNCEMENT OF DOCTORAL COMPREHENSIVE EXAMINATION" (<http://hsc.unm.edu/som/research/bsgp/forms.shtm>) should be completed and sent to the Director of the Biomedical Sciences Graduate Program. The student must ensure that their transcripts accurately reflect all completed coursework and contact the BSGP office in case of any errors.

The Comprehensive Examination Committee will be composed of the student's COS. Approximately one week after the submission of the written proposal, the student will orally present the proposal to the COS and other interested parties in a public seminar to be no more than 50 min in length. The seminar will be followed by a brief question and answer period. The Committee will then privately question the student on the proposed project with the aim of 1) determining with the student what, if any, additional coursework needs to be completed before undertaking the project; 2) helping the student to define the appropriate limits of the project; 3) helping the student to refine the experimental approach to the problem.

The goal is to help the student define an appropriate research proposal for his or her doctoral dissertation. The proposal may be accepted, accepted with modification, or rejected by the Committee on Studies. If the proposal is rejected or requires major changes, the student must resubmit the proposal for consideration by the COS within six weeks. The "APPLICATION FOR CANDIDACY FOR THE

DOCTORAL DEGREE” form must be completed (<http://hsc.unm.edu/som/research/bsgp/forms.shtm>). Students must complete 48 credits to be eligible for advancement to candidacy.

It is *strongly encouraged* that MD/PhD students submit their written proposal as a predoctoral fellowship application for extramural funding. For instance, they should consider applying for a Ruth L. Kirschstein National Research Service Award for Individual Predoctoral MD/PhD Fellows (F30) (<http://grants.nih.gov/grants/guide/pa-files/PA-05-151.html>) or a similar type of predoctoral fellowship. Students should seek advice from their COS regarding other potential sources of funding and on the best way to proceed to prepare a competitive application.

Dissertation (699) Hours

MD/PhD students must complete a minimum of 18 hours of dissertation (699) credit. **Enrollment may not begin prior to the semester in which the student presents her/his dissertation proposal (comprehensive examination).** A student who fails the comprehensive examination may not register for dissertation hours (699) again until the comprehensive examination is passed.

Enrollment for dissertation (699) may be for 3, 6, 9, or 12 hours per semester, with 9 hours the maximum in summer session. The specific number of hours should reflect the amount of time the student is devoting to working on the dissertation. The minimum enrollment in 699 for one semester is 3 hours. Research assistants should enroll for 6 hours of 699 per semester.

Appointment of Dissertation Committee

The Dissertation Committee must be formed no later than the first semester of enrollment in Dissertation Hours (699). The committee oversees the student's progress toward production of a suitable dissertation by providing advice, counsel and criticism of the student's work. The Dissertation Committee must fulfill the criteria stated in the OGS web site (committee guidelines are available as part of the Appointment of Dissertation Committee form, online at <http://www.unm.edu/grad/eforms/committee.PDF>) or the UNM catalog. One of the committee members, the external member, must hold a regular full-time appointment outside the student's unit/department at UNM. The member may be from UNM or another accredited institution. The dissertation committee must be approved by the Biomedical Sciences Graduate Program.

Ordinarily, the dissertation director is the chair of the COS and the remaining members are the other members on the COS; in any case, the above requirements must be met.

When the members have been determined, the "APPOINTMENT OF DISSERTATION COMMITTEE" form (<http://hsc.unm.edu/som/research/bsgp/forms.shtm>) must be completed and sent to the Biomedical Sciences Program Office to officially form the committee. The Dissertation Committee must meet with the student at least once every six months. The "REPORT OF COS/DISSERTATION COMMITTEE" form must be filled out and sent to the Director of the Biomedical Sciences Graduate Program immediately after the meeting (<http://hsc.unm.edu/som/research/bsgp/forms.shtm>).

As mentioned above, the minimum number of coursework hours required for the PhD portion of the program is 48 credits. Included in these hours are core courses, selective courses, divisional courses, seminars and research in basic medical sciences hours (Biomed 695). These 48 coursework credits plus 18 dissertation credits are required to complete the PhD portion of the program.

Additional Academic Activities

During the research years, MD/PhD students might be asked to contribute (without extra compensation) to a limited number of SOM recruiting, service and teaching activities, such as for example, tutoring or giving lectures for students in the Premedical Enrichment Program. Whether an MD/PhD can participate in these activities will be determined by his COS and the MD/PhD Program Director. Moreover, students are encouraged to attend once a week a ground round-type presentation offered by any of the SOM clinical departments. In order to maintain their clinical skills, students might want to participate in clinical activities in a limited fashion. They must consult with the Program Director prior to starting these activities and make sure that needlestick and other required medical insurance coverage is current. These activities must take place at times that do not interfere with research.

PhD COMPLETION PROCEDURES

Notification of Intent to Defend the PhD Dissertation

The student must inform the Program Director, the Biomedical Sciences Program Office and the OGS on main campus, in writing, of the intention to defend their Ph.D. Dissertation. A form is available in the BSGP office for this purpose. The defense typically takes place between October and February, so that the student can re-join the medical school curriculum at the end of March (Transitions Block). If students defend their dissertation several months in advance of the start of the Transitions Block, they must provide in writing a plan of the clinical and/or research activities that will take place during this period to the Program Director. The Program Director must be informed in the Spring semester prior to the defense, so that the necessary budget arrangements can be made to cover the transition of the student back to medical school. Students must also petition the SOM to be transferred back to the medical school curriculum.

Dissertation External Review Requirement

Depending on the previously decided selection of an outside review option, one of the two requirements must be met:

1. The dissertation committee must have received a written report from the outside reader of the dissertation. *This person must be an expert on the subject matter from outside the New Mexico educational system.* The individual must have read the dissertation and submitted a written appraisal to the dissertation committee prior to the final examination.
2. Alternatively, the student must have submitted at least one manuscript reporting the research that is the principal subject of the dissertation, of which he or she is the principal author, to a peer-reviewed journal. The comments from the reviews of the manuscript must be received and read by the dissertation committee members prior to the final examination.

A copy of either review report must be sent to the Biomedical Sciences Program Office.

NO DISSERTATION DEFENSE SHOULD BE SCHEDULED UNTIL THE COMMENTS OF THE OUTSIDE READER OR THE JOURNAL REFEREE REPORT HAVE BEEN RECEIVED.

Doctorate Final Examination/Dissertation Defense

At least three weeks prior to the final examination, the form "ANNOUNCEMENT OF FINAL EXAMINATION FOR DOCTORATE" (<http://hsc.unm.edu/som/research/bsgp/forms.shtm>) must be completed and sent to the Biomedical Sciences Graduate Program Office. After it has been approved by Director of the BSGP and the Office of Graduate Studies, a "REPORT OF FINAL EXAMINATION FOR DOCTORATE" form will be sent to the Research Advisor to be completed (<http://hsc.unm.edu/som/research/bsgp/forms.shtm>).

The defense time and date are to be scheduled so that every member of the Dissertation Committee can be present for the entire proceedings. To be prudent, a room should be reserved for three hours. The student should plan a public presentation that is to last no more than 50 min, with another 10 min for public questions. The student is charged with the responsibility of scheduling a room, and developing a seminar notice. He/she may use the Offices of the Biomedical Sciences Graduate Program for publication and dissemination of the notice.

Public Presentation

The public presentation should be in the format of a formal seminar with appropriate visual aids. The student should make every attempt to make the presentation understandable to a general biomedical audience, saving highly detailed and procedural matters for the closed defense session. It is especially important to pay close attention to the development of a clear and concise introduction, as well as a strong summation.

Closed Defense Session

After the public part of the defense, the student shall meet with the Dissertation Committee for a period of one to two hours to answer any questions, and to receive any comments. Members of the Dissertation Committee should provide all requests for changes of the dissertation in writing, so that the student and the Chair of the Dissertation Committee are clear as to the specific nature of the requested changes. The Chair of the Dissertation Committee should distribute the comments of the Outside Reader (or the comments of the Journal Review that may be used in lieu of an outside reader). These comments should be discussed and addressed before the end of the examination.

After resolving all remaining issues, the student will be excused, the faculty will vote, and the student should be notified immediately of the outcome. The Chair of the Dissertation Committee should have the "REPORT OF FINAL EXAMINATION FOR DOCTORATE", so that it may be signed by the Dissertation Committee members. The Chair of the Dissertation Committee should then forward the signed form to the BSGP Director no later than two working days after the examination. In the event that the student has been failed by the Dissertation Committee, a clear plan for changes in the dissertation research and a re-examination must be presented to the Office of the Biomedical Sciences Graduate Program as soon as possible.

Dissertation

The format of the written Dissertation must be in accordance with the rules of OGS and the School of Medicine's Biomedical Sciences Graduate Program. The Dissertation must demonstrate both ability to do independent research and competence in scholarly exposition. It should present original investigation at an advanced level of a significant problem and should provide the basis for a publishable contribution to the research literature in the Biomedical Sciences. There are two options for dissertation formats: 1) traditional, manuscript style dissertations and 2) hybrid dissertations. The student must consult with their Dissertation Committee regarding what format is more appropriate for their particular situation. An instruction booklet, "Thesis and Dissertation Manual" can be obtained from the Biomedical Sciences Graduate Program Office or from the UNM Office of Graduate Studies web page at <http://www.unm.edu/~ogshmpg/>.

Dissertation Submission

A memorandum of understanding is on file at OGS and the BSGP, which establishes the procedure that will be followed to award both degrees simultaneously. This memo outlines the procedure for dissertation submission as follows: "when a student is in the final semester of PhD study, the results of the

dissertation defense will be submitted to OGS, along with a memo from the MD/PhD program director requesting postponement of submission of the dissertation document until the final semester of the student's program (when the M.D. requirements will also be completed). In that final semester, the final dissertation document will need to be submitted by the deadline published in the catalog. The memo will request a waiver of:

1. The 90 day limit following the dissertation defense date for submitting the manuscript.
2. Continuous enrollment in 699 until graduation (enrollment will only be continuous through the semester of the defense).
3. The requirement for graduation in the semester of the defense.

Both degrees will be awarded when the final dissertation document is approved and all other MD/PhD program requirements have been satisfactorily completed”.

Years 5-9. Final Clinical Training: Medical school Phase II and Phase III

Transitions Block

This block will be used to introduce the MD/PhD student back into the clinical arena. The new Transition Block will be a culmination of Phase I activities with cases emphasizing complex and multi-system disease processes. The Transition Block will function as a springboard for the upcoming Phase II Clerkships with further experience in literature interpretation and evidence based medicine as well as orientation to the hospital and clerkships. The format will include three tutorial sessions per week, an autopsy experience, a weekly journal club, and attendance to clinical grand rounds. The hospital orientation also occurs within this block.

Clinical Training

Phase II is the next year and a half of the curriculum and includes problem-based tutorial learning in both inpatient and ambulatory care settings. Continued reinforcement of basic and clinical science integration and development of basic science learning resources for use on clinical services are additional features of this phase of the curriculum.

Students are introduced to Phase II with the last block in Phase I, the Transition Block. This Block examines cases that are more complex than previously experienced and will prepare students for the transition into the clinical years. Students will be expected to rise to the next level of problem solving through the practice of skills in questioning, generating hypotheses, thinking ahead, and in-depth interpretation and analysis of clinical data. In addition, in preparation for Phase II, there will be presentations that include writing notes, reading a chart, introduction to the hospital laboratories, ordering tests, procedures training, computer system (PowerChart) training, common emergency training, and introduction to rounds. In Phase II, students will spend half of their time in an ambulatory setting where they will confront a mix of patients with and without prior diagnoses and with acute and chronic conditions. An equivalent amount of time will be spent on various inpatient services (pediatrics, family medicine, general surgery, internal medicine, neurology, obstetrics/gynecology, and psychiatry). Here students will continue to work in small group tutorials focusing on problems presented by patients seen on these services.

Phase III of the curriculum, lasting approximately 13 months, features more hospital-based clinical experiences in which the student will have progressive responsibility for patient care under house staff and faculty supervision. Students will also be able to select clinical experiences that will assist them in

making future specialty decisions. One month will be spent in a community preceptorship. This experience involves a working relationship with a practicing physician who has chosen primary care as his/her life's work, and who can serve as a role model.

The order of the clerkships is defined by lottery but we do our best to start the MD/PhD students out on a clerkship such as family practice or internal medicine to assist with their transition. The Program Director needs to know as soon as possible when a student is finishing his research work in order to begin the transition back into medical school (i.e. 1 year in advance).

Planning for return to Clerkships

Planning for the return back to the clinical years of medical school should not occur spontaneously or quickly but needs to be planned in a methodically manner. Elements to consider include

1. Make sure you have completed the clerkships that are required for applications to any residency training programs early so that the grades and reviews will be available for applications
2. Taking time off from clerkships for the interview process is becoming more difficult and needs to be carefully planned.

Medical School Teaching

During the final year of the program, students will be required to take a 4-week elective course called on Medical School Teaching. This course will strictly be a learning experience and the student will not receive any other compensation. Appropriate assignments will include preparing and giving class lectures, facilitating lab or tutorial sessions, and leading discussion groups. Assignments may include teaching minority students in the Premedical Enrichment Program, tutoring in phase I, mentoring students during the transition from graduate studies to Phase II, assisting with lab anatomy/histology teaching, etc.

Medical Licensure, USMLE

It is a requirement for medical licensure that you complete the three steps of the United States Medical Licensing Examination (USMLE). Step 1 is taken before you begin your thesis research. Step 2 is taken during your clerkships, at the end of Phase II. Step 3 is taken during your post-graduate clinical training. Medical licensure is administered by each State's Medical Board; the requirements for licensure therefore vary from state to state. The following paragraphs were copied from the USMLE web site (<http://www.usmle.org/bulletin/2006/eligibility.htm>):

Time Limit and Number of Attempts Allowed to Complete All Steps

Although there is no limit on the total number of times you can retake a Step or Step Component you have not passed, the USMLE program recommends to medical licensing authorities that they:

1. Require the dates of passing the Step 1, Step 2, and Step 3 examinations to occur within a seven-year period; and
2. Allow no more than six attempts to pass each Step or Step Component without demonstration of additional educational experience acceptable to the medical licensing authority.

For purposes of medical licensure in the United States, any time limit to complete the USMLE is established by the state medical boards. Most, but not all, use the recommended seven years as the time limit for completion of the full USMLE sequence (many states have implemented a 10 year rule for MD/PhD candidates). While medical schools may require students to pass one or more Steps for advancement and/or graduation, students should understand the implications for licensure. For states that establish a time limit for completion of all three Steps, the "clock" starts running on the date the first Step

or Step Component is passed or, in some cases, on the date of the first attempt at any Step. General information regarding state-specific requirements for licensure can be obtained from the FSMB. For definitive information, you should contact directly the licensing authority in the jurisdiction in which you intend to seek licensure.

Special Notice for MD/PhD Candidates

The common pathway for MD/PhD students involves completion of the first two years of medical school and then moving to graduate school studies and research for a three- or four-year period. Following completion of PhD course work and all or most of their research projects, these students return to complete their two clinical years, thus completing the medical degree in seven to nine years after first matriculating.

The USMLE program recognizes that the recommended seven-year time limit may pose problems for medical licensure for some students pursuing a combined degree (i.e., MD/PhD). It is for this reason that the USMLE program recommends to licensing jurisdictions that they be willing to consider exceptions to the seven-year limit for MD/PhD students who meet certain narrow requirements. The recommended requirements are as follows:

The candidate is working toward both degrees in an institution or program accredited by the LCME and regional university accrediting body and is a student in good standing, enrolled in the institution or program.

The PhD studies should be in a field of biological sciences tested in the Step 1 content. These fields include but are not necessarily limited to anatomy, biochemistry, physiology, microbiology, pharmacology, pathology, genetics, neuroscience, and molecular biology. Fields explicitly not included are business, economics, ethics, history, and other fields not directly related to biological science.

Candidates seeking an exception to the seven- year rule should be required to present a verifiable and rational explanation for the fact that he or she was unable to meet the seven-year limit. Although these explanations will vary considerably, each licensing jurisdiction will need to decide on its own which explanation justifies an exception.

Students who pursue both degrees should understand that while many states' regulations provide specific exceptions to the seven-year rule for dual degree candidates, others do not. Students pursuing a dual degree are advised to check the state-specific requirements for licensure listed by the FSMB.

You need to be aware of the different states' requirements when you apply to postgraduate training programs. The most current information regarding the individual states' implementation of the USMLE time limits can be found on <http://www.fsmb.org>. On the FSMB home page, click on "USMLE", then on "Click here to begin the five-part process;" part 3 has a table with detailed information about each state's requirements for licensure and the time limits for taking USMLE Steps 1 – 3. The Association of MD/PhD Program Directors is in contact with the Composite Committee to explore if it is possible to establish a policy for MD/PhD graduates, which considers their special circumstances. For the time being, however, the USMLE Seven-Year Rule is a very good incentive for aiming to graduate in seven years.

STUDENT INITIATED ACTIVITIES

Meeting with Program Director

MD/PhD students as a group will meet with the Program Director and members of the Steering Committee for an informal lunch meeting at least once a semester. This meeting will provide the opportunity to talk about issues related to the program and to exchange ideas.

Meetings of the New Mexico Society of Student Physician Scientists

The New Mexico Society of Student Physician Scientists is the MD/PhD student organization at the University of New Mexico School of Medicine. This society meets once a month. For more information, visit: <http://www.unm.edu/~nmssps/>.

Annual Retreat

This is a new initiative to enhance interactions and improve general research issues with PhD students in the Biomedical Science program. It is organized by the Biomedical Sciences Graduate Student Society (BSGSS) MD/PhD and PhD students. The purpose is general information exchange where students give brief presentations of their work and discuss common concerns. Attendance of both the mentors and the students is strongly encouraged. Retreat information is available on Schedule of Events on the BSGP website (<http://hsc.unm.edu/som/research/bsgp/currentstudentsfaculty.shtm>) or on the BSGSS webpage (<http://hsc.unm.edu/som/research/bsgp/student/index.htm>).

Admissions and Recruitment

MD/PhD students participate in the recruitment of new students into the program during the Interview Days (typically in January).

National Meetings

During the research years, MD/PhD students are encouraged to attend and present, at least once, in the Annual National MD/PhD Student Conference at Keystone, Colorado, or the meeting of the Association of Physician Scientists (APSA). The Program will provide financial assistance to cover the related expenses.

Translational Science Journal Club

MD/PhD students are responsible for organizing and presenting at this journal club, which will take place once a month and will be open to everybody at UNM.

GUIDANCE AND COUNSELING OF MD/PHD STUDENTS

The Program Director is available to discuss student concerns, academic or otherwise. Problems usually can be most efficiently dealt with if parties are informed early and MD/PhD students should feel free to contact the director directly for any perceived problems.

To ensure that the students have a reliable, consistent source of academic advice there are two committees that the students can use for counsel and guidance, the MD/PhD Program Steering Committee and the COS/Dissertation Committee. The committees may have overlapping membership in some cases. The program office generally should be the starting point for all information gathering by MD/PhD Students. MD/PhD students are also encouraged to consult with their laboratory research advisor.

Crossroads is a student advocacy organization promoting the health and well being of medical students <http://www.unm.edu/~crossrds/>. Membership consists of elected representatives from each class and four physicians at large. Crossroads members recognize the unique stresses that health professionals confront, as well as the increased risk of the development of emotional difficulties and /or dependencies in response to those stresses. Its goal is to provide a forum in which to identify and diffuse stress issues, and to offer confidential support to all students, especially those in danger of impairment, and to educate peers on recognition of these issues and avenues of self-help. Crossroads maintains a resource base of community professionals willing to counsel students.

Guidance on Selection of Rotations and Dissertation Laboratories

The Steering Committee can provide advice over the initial year to discuss potential research opportunities available that meet the students' interests. They can also advise students on appropriate rotations. Students should first meet with the Program Director and bring a list of tentative lab choices to be discussed in advance. The Committee will then assist if necessary in narrowing down the list.

All students need to keep the Program Director up to date when they have chosen laboratory rotations and the Program Director will encourage students to make these decisions in a timely manner.

Points when choosing a rotation or thesis lab:

1. Each student will have an individual experience within the lab. Give consideration but do not place too much emphasis on another person's experience within a given lab.
2. Explore a potential lab in person before finally deciding.
3. Do not have your expectations too high for what you can accomplish during a single rotation. But plan on developing skills related to specific methods. Discuss the project in advance with the lab director since particular compliances may be necessary to perform specific procedures (ie. radiation safety, animal handling, biohazard)
4. When looking for a thesis lab the personal communication with the mentor is critical. Both the quality of the project AND the quality of the mentoring will play a major role in the outcome.
5. Do not have too strong of a preconceived notion of what you want to work on. Be flexible. The final project you choose does not dictate what you will do for the rest of your career.
6. The potential mentor should identify the funding sources that will be used to support him/her during the entire Ph.D. portion of the program.

ADMINISTRATIVE ISSUES

Financial Support

Currently, the SOM provides 1 MD/PhD student/year with a merit-based scholarship consisting of tuition and fee expenses, a stipend and health insurance. Funds are available for funding MD/PhD students through the medical school portion of the program. During the research years, students are then funded through the mentor's funds, training grant support or extramural fellowship support. The primary source of support is the Office of the Dean of the Medical School. Continuing support via this scholarship mechanism is considered merit-based and is contingent on student performance; this program is directed at exceptional students, which are expected to excel academically and play leadership roles in the SOM. Expectations for student performance are high. Examples include:

- 1) Obtain a grade of at least G in all medical school classes.
- 2) Obtain a grade of B+ or above in all graduate courses.
- 3) Score above the UNM-SOM average on the USMLE-1 and -2
- 4) Apply for extramural fellowship funding during the first year research
- 5) Present research findings at national and international meetings
- 6) Publish findings in peer-reviewed articles
- 7) Play leadership roles on student-initiated activities, SOM teaching activities and some SOM committees.

If a student does not consistently meet expectations in some of these areas, the Steering Committee will meet to review the student performance and determine whether he or she should continue to receive his/her merit-based scholarship.

In special circumstances, the steering committee may allow students to pursue an MD/PhD degree in the absence of financial support from the SOM (i.e. all expenses related to the MD portion of the curriculum will be paid by the student).

Publications

Students should provide the MD/PhD office with two copies of any publication on which they are author or co-author.

Malpractice/Needlestick Insurance

MD/PhD students who are matriculated into the program will receive malpractice insurance during their medical school training. If a student decides to participate in clinical activities during the research years, he or she will have to make arrangements to extend malpractice insurance coverage. Needlestick insurance will be provided throughout both the clinical and research years.

Extension of Length of Training beyond 8 Years

If a student and his/her advisor believes that the student is likely to not complete the thesis research in time to graduate from the program in eight years (4 years of research), they must petition the Program Director in writing for a one year extension. This petition should be delivered before January of Year 5. If an extension is granted the mentor will be responsible for the students' stipend until the student begins their clinical rotations.

Vacations and Leave of Absence

MD/PhD students must follow approved policies on vacation time and leave of absence. While the students are on the medical curriculum, UNM-SOM policies applies (see the following web site: http://hsc.unm.edu/som/oss/acad_policies/ap_loa_policy.shtml). While the students are in the PhD portion of their programs, the BSGP policies apply (<http://hsc.unm.edu/som/research/bsgp/currentstudentsfaculty.shtml>)

PROFESSIONAL CONDUCT

MD/PhD students must follow approved policies on professional conduct. While the students are on the medical curriculum, UNM-SOM policies applies (see the following web site: http://hsc.unm.edu/som/oss/acad_policies/ap_conduct.shtml). While the students are in the PhD portion of their programs, the BSGP and Pathfinder policies apply. See the following web sites:

<http://hsc.unm.edu/som/research/bsgp/forms/Student%20Handbook.pdf>

<http://www.unm.edu/~pathfind/>

UNIVERSITY OF NEW MEXICO SCHOOL OF MEDICINE DUE PROCESS POLICY AND PROCEDURE FOR MD/PhD STUDENTS

The MD/PhD program is a highly demanding program for exceptional students. The Dean of the School of Medicine provides full funding for some of the students admitted yearly into the program. This scholarship process allows the School of Medicine to recruit the best students into the program. It provides a stipend for the students throughout their entire medical school years, as well as covering their tuition. Expectations for the students enrolled in this program are high. Continuing support via this scholarship mechanism is merit-based and it could be terminated at any time if the student does not meet expectations (see Financial Support Section above). Whether or not the student is receiving a scholarship, he or she must be in good standing both in the M.D. and Ph.D. curricula to remain in the program.

The Due Process Policy and Procedure of the MD/PhD Program at the University of New Mexico School of Medicine is intended to outline for both students and faculty the course of action that is available should the MD/PhD Steering Committee takes corrective action against a student for failure to maintain academic, ethical or professional standards. Academic requirements include ethical and professional behaviors as well as educational achievement, as noted in the “UNM School of Medicine Policy and Procedure on Student Promotion and Awarding of the MD Degree” and the “Biomedical Sciences Graduate Program Student Handbook”.

Corrective Action

Consideration of a corrective action may be initiated by the MD/PhD Program Steering Committee through its monitoring of student progress. The MD/PhD Program Steering Committee will also consider requests for review or corrective action coming from the Committees on Student Promotions and Evaluations (CSPE), the Biomedical Sciences Graduate Program (BSGP), the student’s COS, or an individual faculty member. Informal attempts to resolve the problem should be documented. Request for review or corrective action from CSPE, BSGP, or faculty members should be submitted in writing. The student will be informed of the request for corrective action. Prior to taking action, the MD/PhD Program

Steering Committee will conduct a fact-finding investigation and review all available relevant information.

The student will be given the opportunity to respond in person to the director of the MD/PhD Program and/or the MD/PhD Program Steering Committee to give her/his input. The MD/PhD Program Steering Committee may choose to convene to conduct the fact-finding and evaluation of the issue and make a report. The student may be required to meet with the committee to give further information.

Based on its review of the case, the MD/PhD Program Steering Committee may take a variety of actions, including but not limited to the following: to monitor the student more closely, assigning an additional academic advisor, remanding the issue back to a specific academic department, etc. The student will be notified within fifteen (15) days by certified letter from the Director of the MD/PhD Program about any decision requiring corrective action. By a simple majority of a quorum of members, the MD/PhD Program Steering Committee may also vote to take subsequent actions, including but not limited to:

Probation

A student may be put on probation if he/she fails to excel academically, ethically or professionally. Examples include, but are not limited to: consistently obtaining grades below C in medical school courses, failure to pass any of the steps of the USMLE, failure to regularly meet with his/her advisor, unexcused absences from educational and/or research activities, unprofessional behavior, etc. In the event that the MD/PhD Program Steering Committee puts the student on probationary status, he/she shall receive written notice from the committee. A student may be required to make a contract with the MD/PhD Program Steering Committee in order to continue her/his education. Contracts will set out the terms under which a student may remain in the program. If a student agrees to the conditions of a contract and he/she fails to adhere its terms, this will be grounds for further action as outlined below. Financial support from the MD/PhD program may be suspended during this period.

Temporary enforced leave of absence

A student may be required to take a temporary enforced leave of absence from further educational activities pending a final determination regarding the student's status. Examples of events that might lead to a temporary enforced leave of absence include but are not limited to: repeated unexcused absences from educational/research activities; substance abuse; repeated incidents of unprofessional behavior; situations in which the student may be a danger to himself, other students, faculty, or patients; or violation of a previously agreed upon contract. In the event that the MD/PhD Program Steering Committee issues a temporary enforced leave of absence, the student shall receive written notice from the committee that he/she may not participate in any further classes, rotations, or research activities until a final determination is made. A temporary enforced leave of absence may last no longer than 45 days. Financial support from the MD/PhD program may be suspended during this period. Within this time frame the committee must make a decision regarding further action. A contract will be required to return to the program.

Suspension

A student may be required to take a longer enforced leave of absence, greater than 45 days, prior to returning to educational activities. Financial support from the MD/PhD program will be suspended during this period. The MD/PhD Program Steering Committee will specify the period of time during which the student must remain on enforced leave. A contract will be required to return.

Dismissal from the MD/PhD program

Failure to meet academic, ethical, or professional standards as set forth in the "Policy on Student Promotion and Awarding the MD Degree" or the "Biomedical Sciences Graduate Program Student

Handbook” may constitute grounds for termination from the program. The student shall be informed in writing of the decision for termination with the specific reasons for dismissal. All financial support to the student from the MD/PhD program will be terminated. Examples of reasons that may lead to the initiation of action for dismissal include, but are not limited to:

- a. Failure to comply with the conditions of a contract
- b. The student fails one of the blocks in the medical school curriculum and fails the exam to remediate this grade.
- c. The student obtains a grade of B- or below in graduate courses.
- d. The student has to repeat any graduate or medical school courses.
- e. The student is not eligible for promotion to the next stage of his/her graduate or medical education for any reason.
- f. The student fails any of the United States Medical Licensure Exam Step 1 in the third attempt.
- g. The student does not make appropriate progress on his/her dissertation project, as determined by his/her COS.
- h. The student fails his/her Ph.D. qualifying or comprehensive exams, or dissertation defense.

If the student is dismissed from the MD/PhD program, he/she has the following options:

- a. Petition the appropriate CSPE to become a regular medical student and be responsible for all costs related to his/her medical education.
- b. Petition the BSGP to become a regular Ph.D. student. This should be done in conjunction with a suitable mentor who is willing to support the student.
- c. Student may withdraw from both the medical school and Ph.D. programs.

APPEAL OF THE DECISION OF THE MD/PhD PROGRAM STEERING COMMITTEE

If a student disagrees with the decision of the MD/PhD Program Steering Committee, he/she is entitled to a hearing by an Appeals Committee. While the students are in the MD portion of the studies, the appeals procedure explained in the Medical Student Handbook corresponding to the entering class of the student in question will apply. While the students are in the Ph.D. portion of the program, the School of Medicine Graduate Student Academic Grievance Procedures will be followed, as explained in the BSGP Student Handbook.

APPENDIX A

Steering Committee

The overall responsibility for the MD/PhD program resides with the Steering committee composed of 5-6 MD or MD/PhD researchers in the School of Medicine. The Program Director chairs this committee and reports to the Assistant Dean of Graduate Studies and the Senior Associate Dean of Research. The Steering committee makes all major financial and policy decisions in close communication with the Education Committee of the Medical School. This committee is also responsible for the admissions process.

MD/PhD Program Director

This person is responsible for implementing the policy for the steering committee. He/She interacts directly with the Senior Associate Dean of Research and the Assistant Dean of Graduate Studies, who oversees the Biomedical Sciences Graduate Program.

Career Advisory Committee

Consists of the Program Director and one or two other faculty members (including the research mentor). The committee follows the progress of the students throughout their research and clinical careers.

APPENDIX B: PROPOSED MD/PH.D CURRICULUM (GRADUATE PORTION)

Approved by the BSGP Steering Committee March 20, 2003

This proposed MD/PhD curriculum is designed to allow flexibility for individual MD/PhD students to tailor graduate course timing to fit with the medical curriculum and their own readiness to enter graduate courses. Significant changes from the PhD curriculum include: 1) substitution of Biomed 501-002 (specific for MD/PhD students) for Biomed 501, 2) increased requirement for CMBD Seminar credits, 3) reduction in number of required rotations from three to two, 4) requirement for Biomed 555 Problem-based research bioethics” and 5) credit for up to two graduate selectives based on medical blocks.

COURSE	TIMING IN CURRICULUM	NOTES
Biomed 507 Adv Mol Biol	Fall Yr1 or F Yr2	Typical schedule: Fall Yr1 or Yr 2
Biomed 508 Adv Cell Biol	Fall Yr1 or F Yr2	Typical schedule: Fall Yr2
Biomed 501 Fundamentals for Graduate Research	Fall Yr1, Fall Yr2, Spring Yr2	New course to be designed to help MD/PhD students become translational scientists. Students will take this course each year until they re-enter the clinical curriculum. Different content for each year.
Biomed 525 CMBD JC	Fall Yr 2	Conflicts with medical curriculum in year 1, requires 2 nd year placement
Biomed 530 CMBD Seminar	Spring Yr1, F/S Yrs 2-4	Seminar will be taken each semester until students re-enter clinical curriculum
Biomed 506 Rotations	As can be scheduled, two (2) required and completed by end of Fall Yr2	*Change from PhD curriculum. Reduction in required rotations from 3 to 2 based on scheduling issues and conflicts
Biomed 555 Problem-based research bioethics	Fall Yr3	*Requirement for MD/PhD students.
Selectives	Spring Yr2 and/or Spring Yr3	*MD/PhD students will be granted credit for up to two “selectives” based on satisfactory completion of the Phase I medical curriculum. MD/PhD students will be required to take a minimum of one graduate selective.
Research(Biomed 695)/Dissertation Hours (Biomed 699)	Spring Yr2 until complete PhD portion of curriculum	
Qualifying Exam	Fall or Spring Yr2	*Timing will depend on completion of course requirements.
Additional advanced coursework		As determined by the student’s committee on studies (COS) and departmental requirements. The COS will be established immediately after completion of the qualifying exam.

