

Preparing for and Applying to MD/PhD Programs

By Bryce Mendelsohn

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So, you're thinking about applying to MD/PhD programs. Well, having done just that, and looking back on the experience, I wish that there had been more specific suggestions for me to follow. These programs and their applications process differ from regular medical school or graduate school in significant ways. My hope here is to provide you with some answers—perhaps more than you wanted to know—to questions you may have regarding the nature of MD/PhD programs and the application process, all the way from the beginning of college to your interviews. Since there are many overlaps with the procedures for regular medical school application, I will not dwell on these common aspects, and will instead focus on the unique characteristics of MD/PhD programs.

Do I want to be an MD/PhD?

Of course you do! Seriously, though, MD/PhD programs require a great deal of preparation, and last on average between 7 and 8 years, so you want to be sure you know what you are getting into. I would advise seriously looking into pursuing an MD/PhD if you are interested in any of the following:

- A career in which you combine scientific research and clinical medicine.
- A clinical practice which involves a great deal of clinical research.
- A career involving teaching and medical education.
- A career as a researcher whose area of study addresses a disease or condition which is commonly treated by doctors.
- Any career that involves a combination of science, medicine, and/or teaching.

MD/PhDs always have the option of simply “using one degree,” so after the program you can still decide what career suits you best. The MD/PhD gives you a lot of flexibility to pursue anything from clinical medicine to scientific research, and everything in between. Just be sure you need that flexibility before diving in. Please, please speak to as many people as possible about the joint degree and its uses, and be sure it's right for you and will prepare you best for the career you want. A large part of the application process involves the schools you apply to ensuring that you know what you're getting into.

How do you go to medical school and graduate school at the same time?

Well, you don't really. The most common curriculum involves going to the first two years of medical school, which are largely classroom-based, followed by graduate school, where you will do all your research and write and defend your PhD thesis. Then, you go back to the clinical rotations that represent that last year or two of medical school. Varying slightly by the school, this takes about 7-8 years. Some schools include research/graduate experiences during the medical school years, and/or clinical experiences during the graduate years. Also, some schools give students the option of doing their PhD work between their first and second years of medical school, or finishing medical school before going on to graduate work. This option varies greatly from program to program.

By when must I decide if I want to pursue an MD/PhD?

If your alternative to pursuing an MD/PhD is to attend regular medical school, then you really don't have to decide until you send your applications to schools (see timeline). The MD/PhD application is the same as the medical school one, just with extra parts, so you can always withdraw from the MD/PhD program, and ask to be considered only for medical school. In fact, at most medical schools, if you are not accepted to the MD/PhD program, you will still be considered for the regular medical school. If your alternative is graduate school, you should probably decide earlier because you would need to take the GRE. The good news is that graduate school applications start about 6 months after medical school, and aren't usually rolling.

What about *gulp* standardized tests?

For MD/PhD, take the MCAT as if you were applying to regular medical school. Many schools ask for the GRE if you've taken

it, but I am not aware of any schools that require it. (My opinion: The MCAT is much harder than the GRE, so it's more than sufficient.)

What classes should I take?

You have to take the standard pre-med classes, which vary from medical school to medical school. I won't go into much detail, since it's the same as regular medical school requirements. I will add that you should be wary of using AP credit to fill requirements. Many schools do not accept AP. While you don't have to retake a course you have AP credit for, you should take another class in the same subject area. Also, some schools require 2 semesters of English. Most of the schools I have contacted (UCLA, Columbia, Harvard) will take 1 semester of English and an Emory Writing Requirement to fill the English requirement. If you don't want to take a second semester of English, check with the schools you want to apply to and see if the writing requirement will make them happy.

Also, you should probably major in biology, chemistry, neuroscience, or whatever science it is in which you want to pursue graduate work. Most schools require this, and you will have a hard time in graduate school without a solid base in your science of choice.

What kind of grades/scores do I need to get into an MD/PhD program?

This question is very hard to answer, because people with high grades and scores get rejected every day, and people with lower grades/scores get accepted just as often. In general, higher "ranking" MD/PhD programs (top 20 or 30 in US News) have an MCAT average around 35, and a GPA average around 3.70-3.90. (These are just averages.) The thing to keep in mind is that MD/PhD programs get fewer applicants than regular medical school, so they don't need to rely on your grades/scores as much to get through their huge stack of applicants. I really believe they take a closer look at each applicant. Your grades and scores need to be competitive, but your research experiences and other activities are just as important.

MD/PhD programs are competitive. In terms of percentages, though, it's less competitive than regular medical school. It is normal for a medical school to receive 6,000 applications for a class of 120. This is less than 2% getting in. From the few schools I know a lot about, the MD/PhD programs get 250-400 applications, of which 50-80 are interviewed, and 20-40 are accepted to fill between 8 and 20 spots (not everyone who is admitted enrolls). Remember that these are very rough numbers. The point I'm trying to make is that the MD/PhD applicants rank highly among medical school applicants, but acceptance is by no means a dream.

How much research should I do?

Because research is at the heart of an MD/PhD program, you need to demonstrate a serious interest in research. While you don't have to start in a lab freshmen year, you should plan on spending at least 2 semesters in a lab, and more would be recommended. In general, you will probably spend 10-15 hours a week in lab during the school year, which is about the same amount of time (or more) as an upper-level class. Keep this in mind when scheduling your semesters. Also, remember that you start the application process before senior year, so make sure you have some significant lab experiences before then. (MD/PhD programs will take note if you plan on continuing lab work your senior year.)

I want to stress that you do not need to accomplish all of the following to be a good applicant. Research comes in many shapes and sizes, and here are a few suggestions of ways of pursuing research that will strengthen your application:

- Try and work in a lab for at least a year, preferably more. Doing 2 semesters of BIO 498R (or 499R for NBB) and then SURE in the summer is a great way to get a long-term lab experience. MD/PhD programs like to see commitment to a project and the ability to make real scientific progress. Plus, you'll probably get enough done to write an honors thesis and/or publish a paper, which makes them happy.
- Having diverse experiences can help. Working at a pharmaceutical company vs. an academic lab, or with yeast vs. mice, gives your application a sense of well-roundedness, and can improve your insights in your essays. Summer-long internships are the best way to do this. The only caveat is that you don't make a lot of progress on a project in just a summer, so don't let lab diversity entirely replace a long-term lab experience.
- This one's a must: Know your research! Know what you did, why, how, when, where, etc. You will have to talk about it ad nauseum in your essays and interviews, and people who know more than you do about your area of research will be asking you questions about it. They don't expect you to know more than a PhD, but they do expect you to be very familiar with the work you did.

How do I find a lab?

To find a lab not affiliated with Emory, I looked for internship programs, and sent my resume to a lot of companies. Talk to your advisor for some suggestions, and the good people at the Center for Science Education may be helpful as well. To find a lab at Emory, go to the SURE website <http://www.sciencenet.emory.edu/SURE>, and find a list of mentors that are in

your area of interest. You can talk with them, or have a trusted faculty member give you suggestions of labs that are helpful and good to undergraduates. Before entering a lab, be sure that your mentor understands that you want a real research project, and do not want to wash test tubes (but be nicer than that). Some undergraduates do get misused.

Do I have to be published?

It certainly does look good to be published, and I have my suspicions that some schools may prefer it. However, for most if not all schools, if you are working on a project, have made good progress, and can talk about it, you're 99% as good as published. In general, if you have made progress on a project, you will eventually publish it, and in the meantime you can tell the schools that you're going to publish, and that makes them happy. In summary, if you are able to start research earlier so you can publish before you begin applying, more power to you. If not, don't worry.

What other extracurricular activities should I pursue?

Besides research, the only MD/PhD-specific extracurricular I can think of is teaching. While certainly not mandatory, if you want to go into academic medicine, it might help to tutor for a few semesters. The multi-cultural office hires student tutors, and there's always Orgo Mentors. Other than that, extracurriculars such as community service and volunteering at medical establishments are the same as applying to regular medical school.

I'm interested in biomedical engineering. Are there any MD/PhD programs for me?

Yes! Many schools offer a PhD in some area of biomedical engineering, biophysics, etc. Significantly, some programs offer the joint degree in cooperation with another nearby school. I believe that Emory has a program with Georgia Tech, UCLA has a program with Caltech, and Harvard has a program with MIT, to name a few. Just be sure to indicate on your secondary application that you are interested in biomedical engineering, so when the school invites you to interview, they can arrange for you to visit the engineering school.

What's this MSTP thing I keep hearing about?

MSTP stands for Medical Scientist Training Program. These are MD/PhD programs, and are specifically funded by the NIH. Schools with these programs are usually among the best, but don't discard a school as being beneath you just because it isn't MSTP. There are around 39 MSTP schools right now. The number changes a lot. Go to <http://www.nigms.nih.gov/funding/mstp.html> to see a list of NIH funded MD/PhD programs.

The other main difference between school-sponsored and NIH sponsored (MSTP) MD/PhD programs is that with MSTP, usually all of the MD/PhD candidates receive free tuition and a stipend (although this is not universal). For school-sponsored MD/PhD programs, be sure and check how the school funds its candidates. Sometimes no one gets funding. Sometimes everyone does. Sometimes you get funding while in grad school, but not while in medical school. Look into it. The University of Cincinnati has compiled some of this information. Go to <http://www.med.uc.edu/pstp/2k/mdphdprograms.stm>, which has information about a number of other programs. <http://www.med.uc.edu/pstp/2k/fundingothers.stm> also at the University of Cincinnati is a good place to look at funding.

AMCAS starts accepting applications in June, but when should I submit mine?

Right away! The advantages are tremendous. Your AMCAS application can be turned in anywhere from the beginning of June until around October 1. Submit it as soon as humanly possible. You'll have plenty of time to work on it in April and May. The same goes for your secondaries. Some schools give you a deadline of a few weeks after you receive the secondary, but most give you months. Turn them in quickly, within 2 weeks if possible.

By turning all your applications in early, you:

- will get your secondary applications earlier, and can finish most of them before school starts, which will save you more headaches than you can imagine.
- are somewhat more likely to be accepted, since many schools operate on a rolling admissions process. They will have many more spots open if you apply early, and you will be among the first they interview, instead of in the middle, or last.
- can find out what kind of applicant you are early in the game. If you're not sure whether you'll get interviews everywhere or nowhere, applying early will tell you this quickly. Based on the responses from schools, you can decide to drop some schools, or schedule your top choices earlier. Or, if you don't get many interviews, you're more likely to get into the school you do interview at, and you can initiate backup plans (such as taking a year off) sooner.
- save yourself so much inconvenience with interviews. The sooner you get offered interviews, the more flexibility you have to schedule them.
- might even get accepted in October, and be able to relax, or at the very least, withdraw from some schools and save yourself a lot of flying and interviewing.

How does applying differ from regular medical school?

The backbone of the applications process is the same. Here is a rough timeline

Freshman, Sophomore, Junior Year.	Aug. before Junior year, or April during Junior Year.	April–June of Junior year.	June after Junior Year.	August–October of Senior Year.	October–March of Senior year.
Take required classes. Do Research.	Take MCAT.	Think about personal essays, collect letter of recommendations.	Submit AMCAS.	Do Secondaries.	Interview.

The important differences are as follows:

- Some schools want you to submit an application for their MD/PhD program around the same time as AMCAS, which is in early June. The only two I know of like this are UVA and U of IL at Chicago. If a school wants the MD/PhD application this early, they will usually let you know when they receive your AMCAS. Still, if you aren't sure, ask the school. Their web pages are helpful.

- Usually beginning in July or August, when you begin to receive secondary applications, the schools will already have included the MD/PhD application, which you should fill out. This especially applies to MSTP schools. Make sure you fill out an MD/PhD application for every school. They like to hide them. Sometimes you have to call and request one. Sometimes they're online.

- Get letters of recommendation from everyone you've ever done research with (at least in college). A lot of schools say, "if you tell us about a research experience, we require a letter from your mentor."

- Make sure the people writing your letters of recommendation know you are applying to MD/PhD programs. (For info on letters of recommendation, go to the career center.) If relevant, suggest that they talk about your interests in both science and medicine, or in teaching, leadership, etc. For example, if your rabbi, priest, minister, etc. writes about what a great doctor you would make, it would be better if they also mentioned your critical thinking skills, etc., which apply to science.

- Many programs require that the MD/PhD application be sent to a different address from the secondary. Also, they often want different sets of letters. E.g. the regular medical school will want letters from your professors, and the MSTP or MD/PhD program will want letters only from your research mentors. Make sure to tell the career center which letters go where.

- Be nice to the career center, but be firm. Make sure they send your letters correctly.

- Interviews: MD/PhD interviews are usually two days, or sometimes a whole weekend (Thu. – Sun.). Others are just one day. Most interviews include a Thursday, although a few schools (Stanford and Mount Sinai come to mind) do the interviews on Mondays or Tuesdays. Because of the length of the interviews, you won't be able to string a whole bunch into one week. Keep this in mind when deciding how many schools to apply to, and how to schedule your interviews. Also, bring a couple of shirts and ties (or equivalent female formal attire) so you look a little different from day to day.

- Sometimes you will get an offer for an interview at a school, but it won't mention the MD/PhD program specifically. This is probably an offer for the medical school alone, meaning that your MD/PhD application hasn't worked its way through the system yet. Ask the school if a decision has been made on your MD/PhD application, and ask about interview scheduling.

- Most if not all MSTP schools do the medical school and MD/PhD program interviews in the same trip. Non-MSTP schools may or may not be this nice. You might have to go there twice.

How about my essays and my personal statements?

There are several essays you will have to write. The Practice Vision (What do you want to be when you grow up?) and the Personal Statement are common to all medical schools that take AMCAS (which is all of them except Columbia, NYU, the schools in Texas, and a few others). My only advice for these is to make sure you depict your interests both in medicine and science.

The MD/PhD applications will have their own essays. Some are creative, but most are a variation of: "Why do you want to be an MD/PhD, what research have you done, how does this all fit together into what you want to do with an MD/PhD?"

In general you can recycle your MD/PhD essays for each school, but be sure you make the necessary changes, since they are all just different enough that you can't say exactly the same thing.

What will they ask me at the interview?

Most questions are common to all medical school applicants. Here are a few that will probably come up for you as an MD/PhD applicant:

- Why do you want to be an MD/PhD? (This is a very important question. One of the main criteria schools use when accepting applicants is whether or not they want to be an MD/PhD for the right reasons. If you appear to simply be interested in only medicine or basic, non-medical science, your interviewers will recommend that you go to medical school or graduate school.)

- What career do you hope to pursue with your MD/PhD?

- How did you become interested in an MD/PhD?
- If there were no MD/PhD programs, would you go to graduate school or medical school?
- Tell me about your research.
- Tell me more about your research.
- How do you feel about healthcare, managed care, and the impact it may have on doctor's salaries?
- What type of research do you want to do?
- What kind of patient care do you want to do?
- How does the length and commitment required of an MD/PhD candidate fit into your plans for a family, etc.? This question is usually asked of women and is inappropriate because many issues might cause a delay in the student's progress, whether the student is male or female. Just answer confidently that you are committed to completing the program.
- Who have been some of your mentors (often in the arena of research)?
- Tell me again about your research.

Be sure to really, really, have thought about these questions, and perhaps even rehearsed them in a mock interview with a faculty person you trust.

What should I ask them at the interview?

When an MD/PhD program interviews you, they are also trying to sell their school to you. You should ask them some pertinent questions that will help you get a sense of what they're about, and whether they are right for you. While the things that people want to get out of an MD/PhD program vary widely, there are some numbers about the program you should find out, and a few questions you might wish to have answered during your interviews.

Numbers to find out:

- How many students do you interview/accept/enroll?
- What is the stipend, how long can I receive it, and how many of your accepted applicants receive funding? (The average is around \$20,000/year for an MSTP program)
- How long does it take, on average, to finish the program here? (If the average is more than 8 years, find out why.)

Good questions to ask:

- What careers do your graduates go on to pursue?
- What flexibility is there in your program in terms of when one finishes medical school, starts graduate school, and then goes back to medical school?
- What is your research? (They love to talk about their own research.)
- How did you get interested in that work?

One final quality you may want to investigate is the way in which the school combines the MD and PhD portions of the program.