

**To:** Olin Students

**From:** Janey Pratt, Senior Partner in Health Sciences

**Subject:** Information for Students interested in medical professions

Preparing for a career in the health sciences can be a fun and exciting time. You will be expected to gain a thorough understanding of the concepts of the physical and life sciences. Studying these subjects, while difficult at times, is the framework for what is a lifelong learning process: the practice of medicine.

### **Academic Preparation:**

The minimum requirements for medical school are:

Biology:	1 year with lab
Inorganic Chemistry:	1 year with lab
Organic Chemistry:	1 year with lab
Physics:	1 year with lab
Math:	0.5-1 year of calculus level or higher
English:	1 year including writing and literature in some cases
Biochemistry	1 semester required by 27 schools

Actual requirements vary greatly depending on the specific medical school. For example several medical schools require Social Sciences, some require two years of biology and some require statistics. If you know at least some of the schools to which you plan to apply you should review that schools specific requirements. For example, if you are from a state with a state medical school, you should look at the requirements for your state school. Most state school requirements may be more stringent than Harvard or Stanford

Information on specific requirements of each school can be found in the Medical School Admission Requirements book from the Association of American Medical Colleges. There are two copies of this on the Olin Campus. One is in my office and may be looked at anytime I am on campus or borrowed from me at any time. The second should be available in the Olin Library. There are also two copies of this book in the Wellesley Science Library. Dental and Vet Schools Admission Requirements books are available at the Wellesley Science Library. You may order your own copy on line if you prefer at AAMC.org (medical), ADEA.org (dental), or AAVMC.org (veterinary).

There is NO specific major requirement to get into medical school. You may find that General Engineering will offer you the most flexibility to fulfill your requirements within the 8 semesters of Olin class time.

Even if you are only thinking about medicine right now I do want you to understand that the most important things you can do for your future application to

medical school is to do well in your courses, especially Organic Chemistry. Medical schools remain very competitive, especially some of the better and less expensive state schools. Specifically most applicants should have a “Science GPA” above 3.5 and an overall GPA above 3.3.

What this may mean is that you should try NOT to overload your schedule in order to “fit it all in” for an early application if this is going to mean sacrificing on your grades. If you need to take some courses in the summer or take a year off before applying to medical school in order to get all of the requirements done this will not hurt your application, and may in fact help it. Summer courses are acceptable to medical schools as long as they come from a well-respected American college. Over 2/3rds of Wellesley students take at least one year off before applying to medical school and the overall Medical School application rate is about 50% are right out of college while the other 50% have taken one or more years off.

### **Biology:**

If you have a 4 or 5 on AP Biology Exam you may take an advanced biology with lab course instead of one of the introduction courses however you will still need a full year of college biology with lab for most medical school. Feel free to discuss these choices with Joanne Pratt, Helen Donis-Keller or Janey Pratt at any time.

Biology at Olin: First Year Biology with Cohort does not completely correlate to any course at Wellesley or Brandeis. However it shares more with Cell Biology than any other course. You will need a second course in biology which concentrates on biologic physiology or organism biology and has a lab. **Biomechanics does not count.**

Biology at Wellesley: Biology 110: intro to Cellular biology (mostly equivalent to Olin 2<sup>nd</sup> year biology)

Biology 111: intro to Organismal biology

Advanced Courses Offered – should always try to take a course with a lab. The department is fairly strict on not allowing advanced courses without previous significant biological laboratory experience or taking 111 or 110. However if you have taken 2<sup>nd</sup> year biology at Olin you will probably be able to take any course that requires either 110 or 111.

Biology at Brandeis: Biology 22a with 18a (lab): genetics and molecular biology (may overlap somewhat with Olin 2<sup>nd</sup> year biology)

Biology 22b with 18b (lab): cell structure and function (may overlap somewhat with Olin 2<sup>nd</sup> year biology or Wellesley 110 Cellular biology)

### **Inorganic Chemistry:**

If you have a 4 or 5 on an AP Chemistry Exam and are able to start in a higher level chemistry class you may still need a more advanced physical chemistry course

fulfill the full 1 year of inorganic chemistry requirement. You should feel free to talk to Janey Pratt about which courses might be the best fit for your prior experience in Chemistry.

Chemistry at Olin: First Year Material Science with Project can be counted for one semester of Inorganic Chemistry at most medical schools however you will still need another semester of inorganic chemistry and for MCAT purposes an advanced introductory course taken in late 2<sup>nd</sup> or early 3<sup>rd</sup> year would act as a review while fulfilling your inorganic requirements.

Chemistry at Wellesley: Chemistry 110 intro to chem. I with lab (fall/spring)  
Chemistry 111 intro to chem.II with lab (fall/spring)  
(Sometimes chem. 110 and 111 are offered in summer)  
Chemistry 120 intensive intro to chemistry with lab (fall only) (most Olin students will want to take this course instead of 110 or 111. It is very good preparation for MCAT's. It is recommended if you have AP chemistry) if you take Chem 120 you will still need another semester of Inorganic Chemistry – Olin MS will count in most cases but not ALL schools.

Chemistry at Brandeis: Chemistry 10a,b or 11a,b Basic and General Chemistry with Chemistry 18a,b lab (a in fall and b in spring one course follows the other, they cannot be taken off semester) This is equivalent to AP Chemistry with a score of 4 or 5 and is probably below the level of most Olin students. (11a,b is offered in the summer)  
Chemistry 15a,b Honors General chemistry with Chemistry 19a,b lab (a in fall and b in spring)

### **Organic Chemistry:**

Organic at Olin: Organic Chemistry 1 is sometimes offered at Olin depending on the year. Every effort is made to coordinate this with Wellesley's Chemistry I course.

Organic at Wellesley: Chem 211: Organic Chemistry 1 with lab (spring and fall)  
Chem 313: Organic Chemistry 2 with lab (spring and fall)  
These may be taken without prior chemistry at Wellesley if you can have AP chemistry with a 4 or 5 grade on the exam and you can show your lab notebook. You may also take it if you can demonstrate adequate prior lab experience which is assumed for ALL Olin students past first year.

Organic at Brandeis: Chem 25 a,b Organic Chemistry with Chem 29a,b lab  
(a spring, b fall also offered in summer)

Organic at Harvard Extension: This is offered over the summer or in the evenings and is a very respected course that several Olin premeds have taken.

**Math:**

Needless to say ALL OLIN students will get sufficient Math to meet the requirements of any Medical, Dental or Veterinary School. These are part of your engineering education.

**Physics:**

You will need to take two semesters of **physics with lab** in order to fulfill your physics requirements. The first year curriculum physics course usually counts as one year, check with your advisor.

**English:**

You should plan to take at least two AHS courses, which will appear on your transcript as English, writing or literature courses. A course entitled "Scientific Writing" for example would be acceptable.

Other specific requirements for course material should be based on the schools to which you plan to apply. These often include: Genetics, Microbiology, Immunology, Virology or Physiology.

**MCATs:**

The standardized test used by most medical schools in choosing between students is the MCAT exam. It is offered April thru August of each year. For example: if you are applying to enter medical school in August of 2009 you would need to take the MCAT in April, May or June of 2008. July - September of 2008 test scores will work but are less desirable. You should plan on having completed most of the science and math requirements including Organic Chemistry BEFORE taking the MCAT as this is the material covered.

There are on-line study programs offered by Kaplan and Princeton. There is an on-campus study program at Wellesley offered by Princeton. You should plan to study in whatever way you did for the SAT2 exams as you may find this test similar, but more advanced and longer. If you are interested in starting a course at Olin, contact Janey Pratt as we will decide on this based on interest.

**Extracurricular Activities:**

You will be expected to have some experience working with patients and working in research when you apply to medical school. Clinical experience can either be thru paid or unpaid work in a hospital or doctors office. You will be expected to have had some contact with sick people and know if this is something you are interested in doing for the rest of your life. In terms of research this can either be thru a summer internship or

during the school year. If you choose to you can direct your capstone towards a medically pertinent engineering problem. You may also wish to choose a junior year internship that is in the medical field.

### **Engineering or health professions:**

Engineering students have been very successful medical students in the past but over the last 20 years as medical schools have changed their curricula towards “problem based” learning, engineers fair even better! The preparation that an engineering education offers for the health professions is far more oriented toward the team work and problem solving skills required in today’s medical schools. They new technology which is being developed today is changing the health professions. A degree in Medicine can be used to practice in a medical field or to do research in Medical Technology. There are also many exciting opportunities to pursue joint degree’s like the Harvard/MIT HST which is just one of many MD/PhD programs. These are ideal for those who think they may want to pursue biomedical research.

### **What is the Next Step?**

If you are considering medicine you should plan to join **Janey Pratt** for a meeting to be announced in November or set up an individual visit. E-mail contact is the most efficient.