

# How to Get a Summer Internship in Organic Chemistry

## The Process

- I. Evaluate the available internships
  - II. Assess your interests and qualifications
  - III. Choose the appropriate internships
  - IV. Apply for internships
  - V. Accept an internship
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### I. Evaluate the available internships

*The internships we recommend evaluating are, not surprisingly, those listed on our website ([www.commonorganicchemistry.com](http://www.commonorganicchemistry.com)). We attempt to include all relevant internships but naturally we miss some along the way. Feel free to scour the web for other internships and internship resources.*

While looking through the internships make sure to take note of things you like and dislike about each internship. This initial evaluation step is just to get a feel for what is out there and where your interests lie.

For the rest of the internship search process you need to understand the basic differences between the types of available internships. In the remaining four steps of this tutorial you will often see the internships separated into **two categories**:

#### **NSF-REU Internships**

NSF-REU (National Science Foundation – Research Experience for Undergraduates) internships are funded by the US government with the goal of helping to further interest in research related careers. They typically involve research opportunities that take place at US colleges/universities and are open only to US citizens/permanent residents. NSF-REU internships tend to prefer students with no previous research experience or those who attend universities where no research opportunities exist. This is because one of their goals is to increase the number of people interested in research careers not just to provide more research experience/opportunities to those who already have research experience/opportunities. Keep

in mind that this is only a preference (not a requirement). Students from all backgrounds and levels of experience can be accepted to NSF-REU internships.

### **Industry/Other Internships**

Industry/Other internships essentially covers everything that is not an NSF-REU internship. Most of these internships will be within pharmaceutical/biotech companies or research institutes. Companies offer summer internships for a variety of reasons. Interns are a source of cheap labor, are a valuable source of potential future employees, and allow companies to fulfill their corporate outreach goals. Industry internships tend to prefer students with previous research experience. They would rather have somebody who can quickly be productive and contribute to the research. Once again, this is only a preference (not a requirement). Plenty of students with no experience get accepted to industry internships.

## **II. Assess your interests and qualifications**

*After looking through the internships, you now need to consider your interests and qualifications. We've laid out a series of questions for you to consider below.*

### **Interests**

#### **What are my research interests?**

Consider your research interests. This could be as broad as organic chemistry in general, or more specific (total synthesis, green chemistry, nanotechnology, etc.). At this point in your education it's normal not to have very specific research interests. Your application, however, will look stronger if you demonstrate a specific interest and knowledge for the research to which you are applying. Look through the internships again and research the topics that seem most interesting to you. After developing a *genuine* interest for a topic (or topics), build up your knowledge on the topic (or topics) and use it to your advantage during the application process.

**We can't stress enough how important it is to have very specific research interests and career goals.**

#### **What are my location preferences?**

Think about where you would like to do an internship. For example, you may be interested in internships close to home or, alternatively, internships far from home. Also, you may consider internships at universities that are on your short list of potential graduate schools. Another great (but limited) option are international internships. We recommend international internships because they are great cultural experiences and also look good on graduate school applications and resumes.

### **What are my compensation requirements?**

NSF-REU internships: All provide **adequate compensation** to get you through the summer.

Industry/Other internships: They vary more than NSF-REU in compensation but most should provide adequate compensation.

### **Qualifications**

#### **Am I a US citizen or permanent resident?**

NSF-REU internships: **Hopefully your answer is YES.** All the NSF-REU internships require that you are a US citizen or permanent resident.

Industry/Other internships: They vary on this requirement.

#### **What dates am I available?**

This is usually a relatively straight-forward question where you look at when your spring semester (or quarter) ends and next fall semester (or quarter) begins. This is different for different schools. However, **problems arise much more for people on the quarter schedule.**

Spring quarter usually ends in mid-June. Most summer internships that take place at a college/university start in the end of May or beginning of June (because they are at schools that use the semester system). If you find yourself in this situation you have a couple of options. First, you can ask the program coordinator if it is ok to show up late. From our experience about 1/3 of them say it's ok but usually only if it's a week or so late. The other option is to finish your spring quarter early. This involves taking your final exams early or having them proctored at your internship location (Having your final exams proctored at your internship location means that your final exams will be sent by your professors to somebody at your internship location who will watch over you as you take the exam). From our experience maybe about 1/3 of professors will be on board with that idea.

NSF-REU internships: Since the majority of these internships take place at colleges/universities they have less flexibility with their time schedules. The internship must take place during their summer session and the biggest cause of problems is the semester/quarter system conflict discussed above.

Industry/Other internships: Typically are very flexible with summer internship dates.

#### **What is my GPA?**

Not all internships have minimum GPA requirements. The internships that do state minimum requirements usually have something around 3.00. **If an internship states a minimum GPA that is higher than your GPA, then you shouldn't apply.** There are plenty of internships that don't mention minimum GPAs. If your GPA is less than 3.00 then you hopefully can make up for it somewhere else.

### **What does my transcript look like?**

Your transcript will show information beyond your GPA such as how you perform in specific classes (typically they care more about science classes), how many units you take per semester (or quarter), if you often withdraw from classes, and specifically which classes you've completed. Some internships require that specific classes have been completed (General Chemistry, Organic Chemistry, etc.). If you have not completed classes that are required by an internship then you shouldn't apply.

### **Do I have two good letters of recommendation (LORs)?**

Many internships ask for LORs. A good LOR is from a science faculty member who knows you well and can describe why you will make a great researcher. Don't just ask for a LOR because you got an A in the professor's class. If the professor doesn't know you and all they can say about you is that you got an A in their class then the LOR will likely not be very good. A good LOR, for example, will come from a professor for whom you work as a lab assistant. If your school doesn't have research labs then ask a professor if you can do an independent study project/presentation. Ask if you can help set up the teaching labs for classes. You could even start a chemistry club. Regardless, keep in mind that LORs carry a lot a weight in the application process.

NSF-REU internships: Typically ask for 2 LORs.

Industry/Other internships: Rarely ask for LORs. Typically require that you put down the contact information for references whom they can contact if they are interested in you. The process is essentially the same as applying for a job.

### **Do I have research opportunities at my home institution? In other words, does my university have a chemistry PhD program (this usually provides undergraduates the opportunity to do research)?**

Many of the NSF-REU internships favor students who don't have access to research opportunities at their home institution. If this is your situation then you have an advantage. However, if you go to a school with research opportunities that doesn't mean you can't apply to these internships. Most internships accept a mix of students. If you find an internship you're interested in then check out the internship website and see if they mention the home institutions of previous interns (often they do). Their own websites are usually a good gauge of how seriously they take this. You'll usually see a mix of students from both research and non-research institutions.

### **Do I have previous research experience?**

NSF-REU internships: Often prefer students who **do NOT have previous research experience**.

Once again, this is just a preference in that direction. If you do have previous research experience there are plenty of NSF-REU internships that will accept you.

Industry/Other internships: Typically prefer students who **do have previous research experience**. As noted before, this is just a preference (not a requirement). Don't be afraid to apply if you have no previous research experience.

### **Am I in a location from which the internship accepts applicants?**

**Many internships accept students from all over the US**. Some, however, specifically mention that they only recruit regionally or locally. Make sure the internships you apply for don't specify regional/local recruitment (unless, of course, you're in that region/local).

NSF-REU internships: Usually accept students from all over the US.

Industry/Other internships: Larger companies often accept students from all over the US. Small and medium sized companies typically recruit regionally or locally.

### **What are my career goals?**

**Most summer internships prefer students who plan on going to graduate school in the sciences to become future scientific researchers**. Students whose future plans include medical, pharmaceutical, dental, veterinary, or law school are at a disadvantage.

NSF-REU internships: Prefer students who plan on going to graduate school because one of their specific goals is to increase the number of people who choose scientific research as a career. In fact, the success of each individual NSF-REU internship program is partially related to how many of their interns go on to graduate school. If you plan to go to medical school (or some other professional school) then you should apply to internships other than NSF-REU internships.

Industry/Other internships: Usually don't mention a preference. However, they likely also prefer students who plan on going to graduate school (for chemistry) because they are likely going to be more serious about chemistry and are potential future employees after graduate school. Students who plan to enter the work force as researchers directly after college (with their Bachelors degree) are also attractive for their future employee potential.

### **Before the internship, am I a freshman, sophomore, junior, or senior? Am I going to graduate before the internship begins?**

**Internships tend to prefer sophomores and juniors**. This is because they tend to have completed adequate chemistry coursework to perform well in an internship (Gen Chem, Org

Chem, etc.). Some internships specifically mention favoring juniors whereas others will specifically say they favor freshmen and sophomores. If you're a freshman you should probably focus on internships that specifically mention accepting freshman. If you're a sophomore or junior you can safely apply to most internships. If you're a senior who is graduating before the summer begins then most internships won't accept you. However, if you're a senior who still has a semester left after the summer then many internships will consider you.

### III. Choose the appropriate internships

*Now that you've evaluated the available internships and carefully considered your interests and qualifications, it's time to choose the appropriate internships.*

#### How many internships should I apply for?

**We suggest applying to no more than 10 internships that require filling out applications and obtaining LORs.** This allows you to focus on your areas of most interest and gives you more time to devote to each application. Some people want to apply to every internship possible. However, consider the following limitations:

#### 1) Your time:

I consider this to be the second biggest limitation. Filling out applications in a quality way requires a significant amount of time. However, it is *your* time so feel free to spend it as you wish. If you plan filling out applications for more than 10 internships then you'll definitely have your work cut out for you.

#### 2) Your references time:

**This is the major limitation.** If you wanted to fill out applications for 10 internships, and all 10 of them require letters of recommendation (LORs), then you'll be asking a lot of your references. LORs are the strongest when they address the specifics of an internship, meaning each one needs to be unique to some extent. You can't just have a generic LOR sent to all 10 internships. In fact, a lot of internships ask specific questions to be addressed in the LOR which adds an extra level of uniqueness. When finalizing your list of internships to apply for look at the LOR requirements and make sure you're not asking too much of your references. I would not ask any of my references to write more than 5 LORs. I would also make sure that the requirements for each LOR are similar enough so that your reference can write one LOR and then make minor/moderate modifications to this LOR to obtain the other 4 LORs.

**If you want to apply to a larger number of internships then apply to more industry internships.**

The process for applying to industry internships is usually less time consuming and often just

requires submitting a cover letter and resume. Also, they usually don't require LORs. Typically you would just put the contact information for your references on your resume.

### **How do I choose the appropriate internships?**

Consider the following points, all of which we've discussed in detail earlier, to come up with a list of internships for which you will apply:

- 1) Match your interests: You should now have a list of your major interests. Use this list to find internships that match well.
- 2) Make sure you qualify: You should also now be well aware of your qualifications. Read each internship carefully to make sure you qualify.
- 3) Highlight your strengths: Apply for internships that highlight your strengths in their application process.
- 4) Consider your time: Don't fill out applications for too many internships. The quality of your applications will go down.
- 5) Consider the time of your references: Don't overburden your references.

## **IV. Apply for Internships**

*Applying for internships is clearly the most important step. Don't rush the process and submit poor quality applications. Also, don't overburden yourself and/or your references by applying to too many internships.*

Application forms, transcripts, personal statements, and letters of recommendation (LORs) are common application materials for NSF/REU internships. These are usually not needed for industry internships, those often just require a cover letter and resume.

### **Application Forms:**

The application form is used to gather information about you. Some of the information is general such as name, address, birth date, gender, ethnicity, and email. Other information is used to help in the decision making process such as GPA, current college, graduation date, US citizenship status, and dates available. Make sure to answer all questions honestly. Also, after you fill everything out make sure that all your answers meet the program requirements.

### **Transcripts:**

The majority of internships do not require **official transcripts**, but some still do. Official transcripts are transcripts that are printed by your college/university registrar and are sent in

sealed envelopes. To send an official transcript you need to contact your college/university registrar and give them the required information (name and address of transcript destination). Alternatively, you can pick up your sealed official transcript and send it via mail with your other application material. Do not open an official transcript! If you open the official transcript then it is now unofficial.

If the internship does not require an official transcript then these are called **unofficial transcripts**. Unofficial transcripts usually require that you go to your college/university registrar and pick up an official transcript. Then you open the official transcript (now that it is open the transcript is technically unofficial) and make a photocopy which you send in printed or electronic form to the internship. Don't send the original transcript because you will need this to make photocopies for multiple unofficial transcripts if applying to multiple internships that require unofficial transcripts. Unofficial transcripts may also be available online through your college/university.

### **Personal Statements/Essays:**

Personal statements are the most important part of the application. Internships typically mention what to write about for the personal statements. Common topics are research interests and career goals. **Make sure to talk about specific research interests and career goals!** Don't talk about your general interest in chemistry and about how you became interested in chemistry at a young age (blah, blah, blah). Be very specific. Mention why an exact research project matches your exact interests and exactly how this will get you to your very specific career goal. Demonstrate knowledge and interest in a specific topic. The reader should be convinced that the internship matches very well with your interests and goals and that you are knowledgeable on the topic.

Under no circumstance should you send the same generic personal statement to every single internship. These personal statements always suck. In fact, a well written personal statement could never be sent to any other internship because it would be written so specifically (addressing specific research topics, names, schools, etc.) that it would not be possible.

### **Letters of Recommendation (LORs):**

Letters of recommendation are the second most important part of the application. Good LORs will be from members of chemistry faculty whom know you well. They will be from professors who can clearly state why you will make a great future research scientist. The recommendation should directly address the specific internship in question.

Make sure your references don't send generic LORs! Also, on your end, make sure not to overburden your references. One way to accomplish both of these goals is to **ask if you can write the LORs yourself**. This is a somewhat common practice for LORs. You write the LORs yourself in a truthful and professional manner. Your reference then looks over each LOR and makes changes as necessary, then sends them off. This saves your references a ton of time and also makes sure that you have some control over the process.

If your references choose to write the LORs themselves make sure to make the process as easy as possible for them. First, make sure they know your accomplishments and future goals. Make sure that the instructions for each LOR are clear. If any LOR needs to be sent by mail provide them with a pre-addressed and stamped envelope.

## **V. Accept an Internship**

*Hopefully all your work pays off and you receive an internship offer (or several offers).*

Here are some tips about internship offers:

- 1) Internship offers are typically made between February and April.
- 2) They typically give you 1-2 weeks to accept or reject the internship offer. If you have other internships that you prefer over the one that made the offer, then this gives you some time to contact these internships to check your status. Make sure to clearly accept or reject an internship within the given time frame.
- 3) **Most Important:** If you accept an internship offer don't later retract your acceptance in order to accept an offer from another internship. Only accept an internship if you are fully committed to attending the internship. The people who run these internships (especially the NSF-REU internships) spend too much time running these internships to deal with flaky students.