Illinois Promise

Undergraduate Research

Why do undergraduate research?

To find out if you like it!

To learn how to do it – very different from classroom

A must for applications to graduate school

It’s actually really fun

Make new discoveries, contribute to body of knowledge, publish papers, become an expert in a field

Perceived requirement for medical school

Is undergraduate research right for you?

Are you thinking about grad school?

Do you find the idea of research exciting?

Are you doing well in your classes?

Do you have the time to devote to it?

Why do labs take in undergraduates?

Train the next generation of scientists

Need a pair of hands on a project

Postdocs and Grad students learn how to mentor

Task 1: Find out the details from your department

Talk to an advisor

Attend workshop specific to your major

How to get course credit?

Restrictions on which labs?

Can I write a senior thesis? What hoops must I jump through?

Can I stay on campus to continue during the summer? Is there $$ available to support me during the summer?

Is there a departmental database of undergraduate research profiles?

Task 2: Decide when to start

The lab will put a lot of time/energy into teaching you before you are independent and producing data

Only one or two semesters – you may not get much done.

The lab will see you as an investment, and needs a return on that investment.

Task 2: Decide when to start

Freshman year? Maybe, if you have prior experience and classes are well under control and you know what you want to do.

Sophomore year? Better – have some core classes under your belt, a better sense for the department. Also, have a lot of time left to accomplish some real work in the lab.

Junior year? At the beginning of the year – hit the ground running.

Senior year? Too late for many faculty, but you never know who might say yes so don’t give up. Consider summer internships off-campus.

Task 3: Find interesting labs and opportunities

Start with your department websites – read faculty profiles
- Try to understand the “big picture”
- Look over a paper or two

Think outside the box
- Other departments
- Summer internships
  - Mayo Clinic
  - Janelia Farms
  - Stowers Institute
  - Any research institute that does not have undergrads

MCB

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Research Topics

Development, Pattern Formation, Regulation of Gene Expression, Signal Transduction

Education

B.A., Harvard University
Ph.D., Stanford University
Postdoctoral fellow, University of California Berkeley

Teaching Interests

MCB 410 - Developmental Biology
MCB 493 - Special Topics Mol Cell Biol
MCB 529 - Special Topics Cell Devel Biol

Wound repair and tissue regeneration; Drosophila genetics; Development and patterning

After wounding or injury some organisms, tissues and organs carry out an elegant process of regeneration to repair and replace the lost tissue. By studying model systems that regenerate well we can understand the mechanisms that promote regeneration and use them to manipulate healing and re-growth in critical human organs.

The process of regeneration involves a series of steps, each of which is poorly understood. Some outstanding questions are: How does a tissue sense damage? How does a damaged tissue initiate new growth? How is regenerative growth constrained so that it replaces only what was lost? How are cell fates properly specified within the new tissue? My lab aims to answer these questions using the

Task 4: Contact Professors

We aren’t scary!

Introduce yourself at courses fair, after class

Email (samples in a bit)

Be persistent

What are we looking for?

Intellectual curiosity

Enthusiasm

Good communication (well-written email)

Good grades (will catch on quickly)

Willingness to commit time

Evidence will work hard, is responsible (job history)

Reason for *my* lab

Others will depend on field

See sample emails

Common mistakes:

Generic email

I want to do research because it will help me in medical school, help me understand the material, will deepen my understanding of biology

It is, in my opinion, ok to say you would like to see if research is the right career choice for you.

Note – you may do everything right and they may just not have space.

Interview

Not all PIs will interview (I do)

Looking for:

- Good communication
- Intellectual curiosity
- Asks questions !!!
- Willing to commit time
- Professional

What to expect in the lab?

Will vary be department and subject

Your behavior

Act / dress professionally, think of it as a job.

Not “business casual” but no holes in clothes or short/tight clothing.

You may be working with reagents that can ruin clothes so don’t wear your favorite outfits until you know.

Don’t talk about that crazy party last night . . . Your boss does NOT want to know. A lab can feel like a family but don’t over-share.

Be respectful.

Who will you be working with?

Often you will be assigned to a postdoc or grad student, who will oversee your project.

This is a good thing – the PI will be busy and travel frequently, won't be available daily

Listen to your supervisor and ask LOTS of questions. There's no such thing as a stupid question – better to ask than to break that $1M piece of equipment.

How much time to be in lab?

You get out what you put in.

MCB standard in 10-15 hours (2-3 credit hours) per week

Best undergrads put in much more.

Summer is great for uninterrupted time on experiments.

What will your typical day entail?

Good question for your interview

Ask other students you know who are doing research

Lab-dependent, but think about this when choosing labs

Universal truths

An experiment may not work the first, second, or tenth time you try it

Must be willing to “troubleshoot” and be creative

Must be good with details, careful

Long periods of time can go by with no progress

Negative results can kill your project

Answering a scientific question can send you over the moon!

Must enjoy the *process* as much as the outcome or you will go batty

Survey

We would like to keep track of I Promise students who are interested in undergrad research

- How many apply to research labs
- How many find positions
- How many stay with the lab long-term and have positive experiences
- How many go on to research careers

Ask that you answer questions in periodic follow-up emails