Undergraduate Research

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The skills needed for a successful career are diverse.

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What is research?

research
/ˈrɛrˌsɛrˌf/ (noun, verb)

noun
1. the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions.
   "we are fighting meningitis by raising money for medical research"
   synonyms: investigation, experimentation, testing, analysis, fact-finding, fieldwork, examination, scrutiny

verb
1. investigate systematically.
   "she has spent the last five years researching her people's history"
   synonyms: investigate, study, inquire into, look into, probe, explore, analyze, examine, scrutinize, review
Why should you consider doing research as an undergraduate?

- Apply classroom skills
- Teaches critical thinking and problem solving skills
- Time management and organization
- Facilitates connections to grow professional network
- Stronger letters of recommendation
- Opportunity to investigate career options
- Science doesn’t always work…important lesson to learn early on
types of RESEARCH OPPORTUNITIES

During ACADEMIC YEAR @ IU:
- Unpaid, volunteer research: you might have to start off volunteering just to get your foot in the door.
- You will want to commit ~8-10 hours/week (different labs have different requirements. Bottom line, there is a good bit of training involved so you need to be in the lab long enough to make it worth everyone’s time)
- Research for credit (e.g., L490)
- Honor’s Thesis – this is a really great way to learn about research from start to finish (i.e., designing and carrying out experiments to analyzing results and writing up the paper).

During SUMMER:
- Research Experiences for Undergraduates (REU) – one of the best options as an undergrad. They PAY FOR YOUR TRAVELS costs, plus a stipend.
- Summer Undergraduate Research Fellowship (SURF)
- Other internships (websites: ecolog, Texas A & M University Wildlife and Fisheries, Bird Jobs - http://www.birdingonthe.net/mailinglists/BJOB.html
so… how do I get into a research lab in my first year?

1. Investigate current research
   - Positions often are not advertised
   - Biology
   - Chemistry
   - Neuroscience
   - Physics
   - Geology
   - Medical Sciences
so... how do I get into a research lab in my first year?

1. Investigate current research

2. Craft resume specific to position

3. Contact potential advisor with a short and informative email – attach your CV (not sure what a CV is? Look it up!)

Example email:
Dear Professor McGonagall,

Hi, my name is Hermione Grainger and I am wondering if you have any open positions (volunteer or paid) in your lab. I am currently a freshman obtaining a biology degree with a chemistry minor. I am especially interested in your research on ovarian cancer and breast cancer (something to specific to show that you have looked over their research – often found in “research” tab on their webpage). Moreover, I am interested in how these cancers respond to endocrine therapies.

Currently, I am enrolled in the following relevant classes: Bio – L211, Chem – C341, and Bio – L113. Additionally, in high school I shadowed a physician at XX hospital. Last summer, I volunteered on a project investigating communication between mandrakes and carnivorous trees in the enchanted forest. Our research suggested possible links between root length and the tempo of mandrake screams.

I am available to work ~10 hours a week if possible. I have attached my CV and a tentative schedule.

Thanks for your time and consideration. I hope that we can schedule a meeting soon at your convenience to discuss this possibility.

With best regards,

Hermione
How to find current research at IU that you might be interested in?

- **Google: IU Biology Departmental**
  - -> Faculty = Principle Investigators (PI)
  - -> Description
  - -> Click a name that interests you and find the link from there that goes to their specific website. Look over their current research topics
Faculty Profile

Jay T. Lennon
ASSOCIATE PROFESSOR
IU AFFILIATION
CENTER FOR RESEARCH IN
ENVIRONMENTAL SCIENCES

Program
Evolution, Ecology & Behavior

Research Areas
- Ecology
- Evolution
- Genomics and Bioinformatics
- Microbial Cell Biology and Environmental Responses
- Microbial Interactions and Pathogenesis

Education
Ph.D., Dartmouth College
Postdoctoral Research Associate, Brown University

Research Description
Microorganisms are the most abundant and diverse life forms on Earth. They attain high population densities, have fast reproductive rates, and evolve rapidly in their environment. Moreover, microbes carry out important functions, including nutrient cycling, trace gas flux, and carbon sequestration, which are important for the stability of natural and managed ecosystems.

We study the ecology and evolution of microbial communities. We are interested in the biotic and abiotic factors that generate and maintain microbial biodiversity. In turn, we seek to understand the implications of microbial diversity for ecosystem functioning. We conduct research in terrestrial and aquatic habitats, and use a variety of tools including molecular biology, simulation modeling, laboratory experiments, field surveys, and whole ecosystem manipulations in natural and managed ecosystems.

Select Publications