What can I do with my **Biology Degree?**

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About you?

- Majors/Minors/Concentrations?
- Career Plans?
- Questions about your academic career leading into a professional career?
- Skills you hope to gain during your 4yrs at Umaine?

Why Today?

- Why cover this topic before you even begin your first year courses??

Why Study Science?

- Learn to think analytically, critically, depend on facts and data collection to remain objective and flexible in your thinking
- Become proficient at designing and understanding the best experiments – avoiding bias, using statistics properly, interpreting data
- Work in teams (collaboration!) and independently
- Keep good (complete, clear, honest) records
- Communication!! To your lab, your scientific peers, the public
- Become excited about understanding the natural world
- Many, many more…

Science: Transferrable skills!

- Learn to think analytically, critically, depend on facts and data collection
- Become proficient at designing and understanding the best experiments – avoiding bias, using statistics properly, interpreting data, selecting controls, dose, time, etc. Asking good, testable questions (and fundable, do-able!).
- Work in teams (collaboration!) and also independently (determination!)
- Keep good (complete, clear, honest) records
- Communication!! To your lab, your scientific peers, the public. Oral and written forms.
- Become excited about understanding the natural world – passion and curiosity are transferrable, too!
- Many, many more…

By working in a lab, or taking lab courses, you are gaining transferrable skills for…

- Jobs in science (numerous examples, including lab jobs)
- Health Professions/Careers (there are over 300!)
- Graduate Programs
- Jobs beyond science…

Let's add to that…SOFT SKILLS

- Creating and updating your CV
- Writing a cover letter
- Interviewing (& the art of the elevator pitch)
- Oral Presentations
- Writing up your lab experiences

Writing in Science

- Writing well is a CORE science skill
- PRACTICE
- READ A LOT (of the type of writing you'll do)
- Get edits from peers, mentors
- Go through many drafts in order to polish it
- Be really proficient at writing an abstract (at least!) before leaving undergrad – this is an essential skill
- Another key one: making a figure, figure legend, and writing the associated results section (most of you will do this here at some point with data you collect)
- A well-written narrative in your CV will be a strong indicator of your science writing abilities, as will be the cover letter

Professionalism and Letters of Reference

- Employers/Schools can read between the lines of a ~~not-so-~~strong letter of reference.

So…Build strong, In–depth interactions with mentors/advisors who can write you a detailed and supportive letter! You should have 3 to 5 in mind as possibilities – stay in touch with them!

- Professors – OK, but do they know your name? Did you do well in their class? Did you go to office hours, speak in class, work with them in some capacity outside of class?
- Employers (ie: Lab head; medical volunteer supervisor) or capstone/ thesis mentors are stronger letters & can speak to your level of commitment, analytical ability, innovation, etc. – and your capacity to be a good candidate for that particular position.

Professional courtesies

- When emailing or addressing faculty, call them Dr. Jones or Prof. Smith. Do not use Ms, Mr, Mrs or their first names (unless told specifically to use first name)
- Always write an email like it is a formal letter – write with respect and professionalism – it is a permanent record and a reflection of you
- When requesting letters of reference, ask early (4+ weeks ahead of deadline, at least). Send the information about the position, where/when to send letter, your CV/resume and why you want this position and are a good fit for it. Ask for a short meeting with the faculty, if they have time, to discuss in person – this all helps make a stronger letter

Finding Research Opportunities

- Undergraduate research group, CUGR (some opportunities to learn of labs that have open positions)
- Talk to faculty – contact them with a professional email to inquire about open research positions or senior thesis research (may need to start as a volunteer if you want a paid position)
- Look for summer research internship opportunities (Maine and beyond)

Opportunities to build your CV while an undergrad at UMaine

- Clubs, organizations, outreach activities (ie: Bio Club, Neuro Club, Health Professions Club, MLA program, etc)
- Do a research thesis in a laboratory (Capstone, Honors)
- Present at a local or regional research symposia (ie: CUGR Showcase)
- Apply for grants (CUGR, INBRE, Honors, etc)
- Medical: shadow a doctor, get certifications (EMT, CNA, wildlife first aid, CPR, etc), volunteer at a community/ medical organization (ie: Ronald Mc Donald house, medical kids camps, Red Cross, Special Olympics, etc)

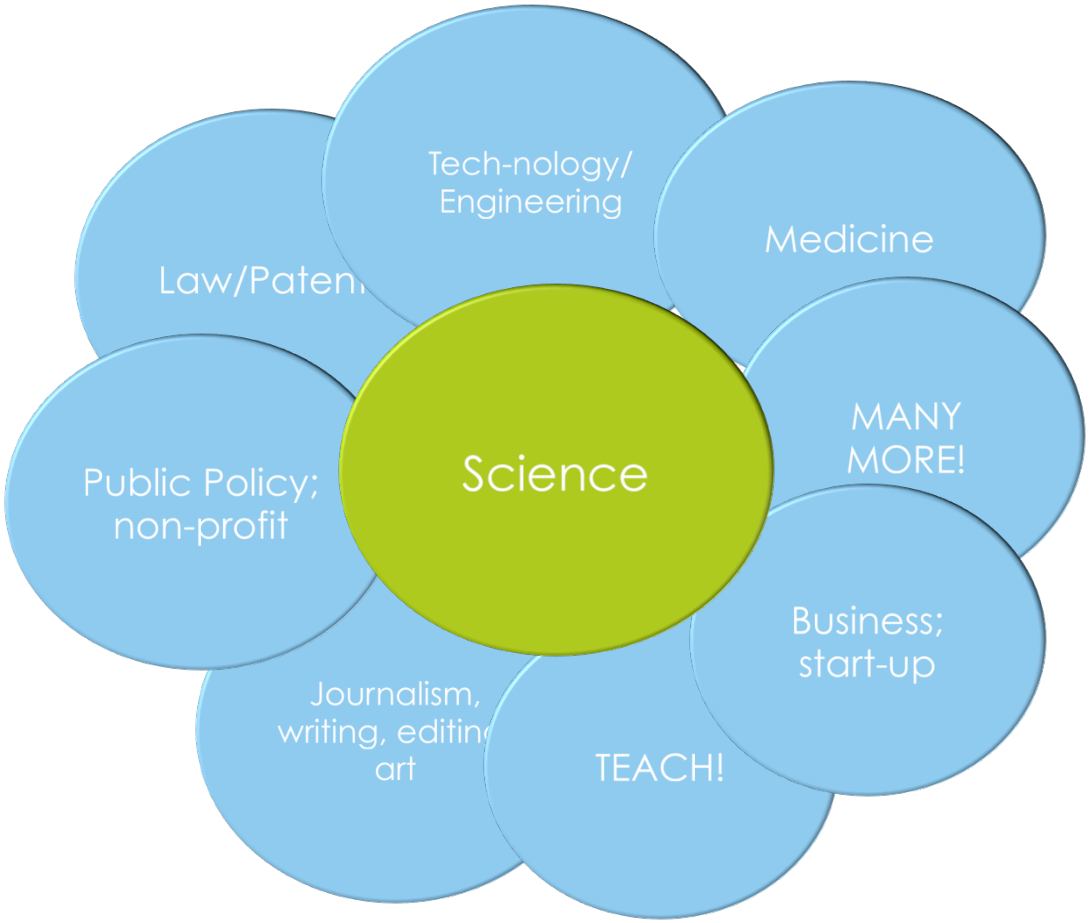
Volunteer! Maine Day, Alternative Spring Break, etc.

- Other ideas?

Jobs after a Bachelor's Degree

- The training you are doing today may be for a job that doesn't exist yet – science, and all fields, are fast-moving and ever-evolving
- Most people in careers today are working outside their college-degree area
- Science is NOT just working at a bench in an academic lab your whole life…

The intersections of Science



What career is right?

- Health Professions – go see: Crissanne Blackie and Monica Zilioli
- Jobs/Grad School – find a mentor(s) to help you navigate this process

Health Professions

- • Very competitive – usually need a 3.5 and very high MCAT scores for med school (as well as supportive experiences, such as research, outreach, medical experience)
- • But remember – there isn't only an MD option! Over 300 health professions exist today.
- • Remember that many MDs do research during their career, so those skills are important, too!

Types of post-graduate work

- Advanced degree (Masters; PhD) → job in Academia (university/college/academic hospital) or → job in industry (gov't, pharma/biotech, non-profit, research institution)
- MD, MD-Ph.D., Nursing (or NP, PA), vet degree, etc
- JD, MBA, MPH, etc.
- On the job training (see first bullet-point) right out of undergrad

Grad School

- Masters? Ph.D.? Something else?
- Masters – typically 2yrs, first year classes/research, 2nd year research/thesis (maybe TA)
- Ph.D. typical outline (post–bach):
  - Year 1: rotations, classes
  - Year 2: classes, qualifying/comprehensive exam, research in thesis lab
  - Years 3–5 +: research, thesis, publications (usually 2), etc
  - May be a teaching assistantship (TA) for any semesters = teaching experience
  - Some programs pay for 1–2 yrs; otherwise you are paid by TA or the faculty's grants
  - Remember the 'package deal': tuition, health insurance (usually), fees (sometimes), stipend – adds up to $50k or more (humanities PhD – no payment!)
  - You are in training, so typically you are not permitted to have a 2nd job (remember science is not Mon–Fri, 9–5!)
  - You will be mentored and trained to enable you to be competitive for a job or postdoc position after graduating
  - Typical thesis: Chapter 1 = Introduction (larger review article, lit review), Chapters 2-4: research chapters (each written like a manuscript, likely submitted for publication). At end of program, thesis completion is followed by oral presentation (may be public or just to committee), and then closed–door defense session with committee.
  - During your Ph.D. training, always keep in mind what your career goal is!! Work towards that, seek opportunities related to that job, build skills an employer would want to see. (ie: industry – and what type?, or academia – and what type?)
  - Pick a lab that not only fulfills your research interests, but that is a supportive culture for your professional and scientific growth. Is there a mentoring plan? Will you be supported to write grants, review aticles, mentor students, take courses/training (outside of curriculum as relevant), attend meetings, present your data, etc, etc… Does faculty have time to meet with you regularly?

Job Hunting

- Start early – what do you need on your CV for the job you want?
- Know where to search for listings based on the job/ position you want (Chronicle of Higher Ed for academic jobs; professional organizations' listings, institution's HR site, etc)
- Prepare a tailored CV and cover letter for EACH opportunity – it does matter. Look at specific key words in the job posting and address how you will meet those needs.
- Apply for more positions than you think you need – experience is helpful, and job market is competitive
- Remember your network of contacts is really useful at this stage!

Academia vs Industry: the age-old question

- Self-driven research vs. dictated by products
- For profit vs non-profit (and the salaries that go with it)
- Basic research vs applied research
- More rigid (ie: record-keeping for patents, strict hours, hierarchies, less job security) vs less rigid (ie: self-directed, fluctuations in funding, more publication pressure)
- Check out both, if you can, and see what feels right to you
- Interviews for either may probe how REAL your CV is – be prepared to answer questions about ANYTHING on your CV. Some industry jobs ask you to do some lab work to prove skills during an interview, too.

Examples of positions you could get with a science bachelors, that may not have occurred to you!

- Editor's assistant for a research journal
- Working for a granting institution, or the sponsored research office at a university
- Teach high school science (yes, with experience you don't need an education major)
- Diagnostics (forensics, medical labs, water quality testing services, food services, etc, etc, etc)
- Arts/Entertainment Industry(ie: PBS educational programming, creating art/content for websites or textbook graphics, designing science-related products, etc)
- Writing!! (in every way, shape, form)
- Sales rep
- Work for a non-profit doing outreach (ie: Ocean Conservancy, Sierra Club)

How to job hunt in the sciences

- Prepare an excellent reputation, up-to-date CV, cover letter, strong reference list – know how to assemble everything into a single PDF for email or upload.
- Network, ask for referrals, ask for 'informational interviews', lean on your network of contacts
- Look for specific postings on websites of labs or companies; look for public listings (HERC jobs, HigherEd jobs, Chronical of Higher Education, journal websites (Nature, New Scientist, The Scientist, etc), professional society websites (Neurojobs, Endojobs, etc)).
- Tailor your cover letter to the attributes that job posting is looking for! Remember your transferrable skills.
- PRACTICE interviewing and predict some questions so you have prepared answers you can lean on if you get nervous (even if they only tangentially apply to the question you were asked! – this works for public talks, too!)
- Professional courtesies: Be on time, be polite and non-controversial, dress tidily, follow-up with a thank you note (email is OK)

How to poise yourself for the most successful science career – my top 10

- 1. START EARLY – like, now, or yesterday! Be involved, attend departmental seminars, read faculty research, ask questions in class, go to office hours, etc.
- 2. Good grades/GPA, good scores (GRE/MCAT, etc) – this is a given, and numerical/quantitative rubrics like these help places weed through the many, many candidates they get (for school or jobs)
- 3. Start, and keep-up, with a resume and a CV (and know the difference!). Get help from colleagues, online resources, career center, your advisor. It should have NO typos, be nicely and clearly written/formatted, be honest and comprehensive, and 'sell' yourself based on what you are applying for. Add to your CV by finding unique opportunities to gain experiences, skills, or contacts. Volunteer, START something, join groups, etc. But always maintain the most focus where it is most needed: school work and work-related experiences.
- 4. Find mentors and cultivate those relationships! A successful career needs different types of mentors.
- 5. Also work on a cover letter. Consider adding in a personal website, or LinkedIn, or ResearchGate… Be aware of your online presence – Google your name from a computer you have never used before.

How to poise yourself for the most successful science career

- 6. Think of your future career and build your experiences around what that field is looking for in candidates. *Medicine?* Shadow a doctor, get your EMT license, volunteer at a hospital. *Industry or Ph.D.?* Work in a lab, do a capstone/honors research project, learn how to read research articles. Etc… Ask people who have the job you want how they got there and what they recommend to best prepare.

- 7. Follow the science/medicine news!! Pick a source that is trustworthy and reliable, and follow their RSS feed, or Twitter/Facebook, subscribe to a magazine, read online newspapers, or get a weekly email blast, etc. This makes chatty conversation easier with fellow scientists and helps you make connections between fields of study.

- 8. Build the non-tangibles: know how to write well (grants, articles, abstracts for meetings, etc), speak publicly (power point and not – FORCE yourself to practice), read scientific literature and know key terms, understand current technology/techniques in your field of interest, learn statistics, be aware of research ethics, network with potential contacts/ colleagues…..etc.

- 9. Are you working on a research project? Be able to give your 'elevator pitch': a 5min, succinct, lay-person description that clearly explains what you are working on and conveys the importance and excitement about it. This is a life-long skill, no matter what field you enter. (or try a Pecha Kucha!)

- 10. You are ALWAYS making an impression, and the world is smaller than you think. Be sure you are always kind, honest, and respectful. When contacting people, always use proper email format (consider even an email as a formal letter), and address people as Dr. or Prof. as appropriate. Be aware of people's busy schedules and prepare to be flexible when setting up meetings.

Does it take a lot of time and effort?

- **YES.**

- And if you don't like that part of it, you may not be cut out for a career in the sciences.
- Things just get more time consuming and require more effort as you go on, and if you don't have the determination, self-motivation, and enthusiasm for what you're doing – you probably won't be successful. So do some soul-searching and ensure you are headed down the career path that is right for you. You only live once!
- For those that enjoy it, science is SO REWARDING (and that doesn't always mean $$). There is nothing like the feeling of making a novel scientific connection or being the first to unravel a puzzle in nature.

CVs for Science

- • NOT a resume (meaning, no page limit and different format) – although keeping a resume is also useful in case you need one
- • Add everything you can think of! Use headings, subheadings, useful formatting – be organized.
- • Always keep a list of things you want to remember to add to your CV, try to update monthly
- • When describing your work in a lab, ask for help to add the appropriate skills to the list – there are probably more than you realize!

Consider putting on a CV

- A professional/personal website (that can be viewed by potential employers and looks impressive!). Another place to highlight aspects of your CV and show expertise
- Linked In – people can vouch for your skills here, and another way to be visible for recruiters
- Research Gate profile (when you have published) – or other similar site
- Narrative – a paragraph or two at the end that describes your career path, future goals, interests, esp. Especially useful if a cover letter is not permitted.
- DO NOT put (in my opinion): objective, photo, other jobs you have applied for or interviewed for, too many 'in prep' papers, work you didn't do, work you can't explain (I have seen all of these, and these people didn't get interviews usually)

CV tips

- Pass the 30sec test. Key/strongest qualities should stand out when skimmed, but there should be enough supporting detail to stand up to scrutiny.
- Reverse chronological order within categories
- Highlight as needed, use active language
- Ask a friend, colleague, or mentor (or several!) to proofread
- Reference List – include for academic, put Upon Request for industry
- More tips/samples:
- http://ocs.fas.harvard.edu/files/ocs/files/gsas-just-for-scientists-cvs-resumes.pdf?m=1439576763
- http://www.sciencemag.org/careers/2006/10/tips-successful-cv

Sections on a BIO B.S. CV?

- Contact Info
- Education & Degree Info (incl. thesis, minors, etc) – high school, too
- Honors/Awards – separate HS and College
- Laboratory Experience
- Other Work Experience
- Leadership, Volunteer work, outreach activities
- Publications or Grants
- Relevant Scientific Skills
- Interests
- Reference

Cover Letter

- Create a template in MSWord using logos for Umaine, SBE, etc (depending where you are CURRENTLY)
- Add your current position, contact info at top
- Add a PDF image of your signature before your typed name
- Add an auto-fill date
- Use for ANY professional correspondence, can even attach to emails or web-forms as PDF. Really conveys a sense or serious professionalism!
- A chance to show that you have specifically considered THIS position and why it is right for you, and you are right for it. Shows writing skills, too.

Cover Letter Examples

Kristy Townsend, Ph.D.
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kristy.townsend@maine.edu

October 29, 2015

To Whom It May Concern:

It is my great pleasure to write this letter of support for

If I can answer any further questions, please do not hesititate to contact me.

Sincerely,

Kristy Townsend, Ph.D.

Kristy Townsend, Ph.D.
Instructor in Medicine; Research Associate
Joslin Diabetes Center & Harvard Medical School
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Boston, MA 02215

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May 6, 2014

Dear BADERC:

Please find enclosed the materials required to initiate my BADERC Pilot and Feasibility Award for the project titled, *Mechanisms of Fatty Acid Sensing and Uptake by Brown Adipocytes*.

1. Copy of accepted application with biosketch
2. Current IACUC approval for vertebrate animal work
3. Statement of Work
4. Statement of Intent
5. Face Page 398

If you require any additional information, please do no hesitate to contact me or Michael Curtis in our Office of Sponsored Research (michael.curtis@joslin.harvard.edu).

Sincerely,

Kristy Townsend, Ph.D.
kristy.townsend@joslin.harvard.edu

Interviews and Elevator Pitches

- KNOW about the place where you are applying (company info, lab's research focus, grad program info, details on each person you are scheduled to meet with – if you get a list ahead of time)
- Come prepared – potentially a folder with copies of your application, extra CVs, publications, etc. Maybe copies of research you did (print-outs of company or employee bios, etc).
- Dress cleanly, simply, and appropriately – smell clean but not like an over-powering scent, remember breath. Firm handshake and eye contact!
- Remember that your application materials got you to the interview, so they know you COULD be a great fit for the position. Now they want to assess inter-personal skills, personality, and to determine if you really represent your written application (& potentially a middle stage of a phone or Skype interview)
- Predict questions ahead of time and be prepared with some bullet-pointed responses. Smile, listen carefully, respond thoughtfully. Don't speak too quickly or slowly. Avoid too much jargon unless the person is in your field.
- Some questions you will likely get:
  - Why do you want this job/position?
  - I see you worked in a lab previously, what did you do there?
    - Time for a well-crafted elevator pitch!!
  - Describe a challenge in the past and how you overcame it?
  - See other lists online of potential job interview questions -- practice

Creating an Elevator Pitch

- Your name, your position, where you are working – then a BRIEF 1-2 sentence, exciting and succinct, jargon-free description.

- Like:

- "Hi, my name is Sally. I am a postdoc at the New University of Lisbon's Chronic Diseases Research Center in Portugal. I am studying how cells assemble an organelle, the cilium, that is like an antenna sticking out of the surface ..."

- More info:

- http://www.nature.com/naturejobs/science/articles/10.1038/nj7435-137a

- http://www.the-scientist.com/?articles.view/articleNo/40702/title/Scientific-Elevator-Pitches/

More tips:

- What is the **topic** of your research?
- What is the **problem, issue or question** that you are asking and addressing in your research? We know that academia is about delving deeper into the topic so what is the core question you want to answer? This can be a compelling introduction to your research.
- **How** are you uniquely addressing this problem, issue or question? What do you do to tackle this problem? Answering this question gives people a sense of how you actually do something — which is important to give a potential collaborator an idea of how you are actually engaging in the world.
- Why is that problem interesting and important? In other words, so what? How does your work connect with a **broader conversation** about this topic/ problem in your discipline and related fields, and what does it add to that conversation?
- Finally, what is the **goal or aim** of the conversation? When you consider how the conversation will help you reach your goal, you can cater your speech to reflect that goal.

Workshop – Elevator Pitches

- To practice, pick something interesting and impressive you did in high school. Maybe you did a Science Fair project, worked in a lab, had an outreach activity with a club, volunteer project, community service, academic or extra-curricular achievement, summer program, etc, etc.
- Decide on one thing, draft your elevator pitch, we'll practice in pairs then share with the group.

Oral Presentations

- For many jobs you may be asked to give a brief oral/power-point presentation about your previous work.
- Create a basic template to follow each time (title slide, formatting, etc)
- KNOW YOUR AUDIENCE and gear the talk to them – especially relevant background, context, rationale
- Title conveys a lot!
- Remember Acknowledgements slide, and always give credit appropriately – for published work, images you find on the web, or collaborative data collection (also on the slides when these are shown)
- Give a simple, clear story – illustrate with visual examples, don't rely heavily on text
- For each slide, know your entry sentence and concluding sentence – there should be nice flow and a golden—thread through the entire presentation
- Use animation, but sparingly
- Your own graphs in a talk should be in COLOR (even if they were B&W as you prepare a manuscript)
- PRACTICE – get feedback
- Be enthusiastic about your work!

You will learn some of this at lab meetings, too…

- When referencing relevant studies as background, show images of their data and
  state the actual specific finding (not just: 'they saw changes in liver') (with reference cited)
- Walk the listener through your project step-by-step, remember to fill In gaps to create a logical flow
- Use appropriate, accurate, technical language
- For data, show what is significant, N-value, etc.

Learning how to learn

- The best way to read a textbook:
- http://www.dartmouth.edu/~acskills/success/reading.html
- The best way to take lecture notes:
- http://www.dartmouth.edu/~acskills/success/notes.html

The Neuroscience of Studying

- Writing notes by hand vs typing
- Reading hard/printed copies vs electronic reading

More Good Resources

- http://sciencecareers.sciencemag.org/
- http://www.sciencebuddies.org/science-engineering-careers

- http://www.postdoc.duke.edu/resources/professional-development

- Biotech: https://career.ucsf.edu/sites/career.ucsf.edu/files/migrate/Job%20Hunting%20in%20Biotech%20Part%201.ppt.pdf

Questions? Concerns? Curiosities?

- Feel free to email me with any additional questions:
- kristy.townsend@maine.edu

- Other GOOD RESOURCES:
  - Career Center on Campus
  - http://sciencecareers.sciencemag.org/
  - http://www.sciencebuddies.org/science-engineering-careers
- Maine Mentor Database:
- • hTp://130.111.184.233/maine%20mentor%20database/findrecords.php?–link=Find