

Guidelines for Undergraduate Research in the Baum lab

Laboratory goals:

> *To contribute scientific knowledge*

- ✓ **Through experiments and theoretical work, we aim to contribute a better understanding of the natural world.** We particularly focus on understanding how life came to arise and diversify into all the wondrous life forms we see around us today. This entails both studies of life as we know it and experiments and theoretical work aimed at using chemical and physical principles to explore how life could (and could not) have been.
- ✓ Good science depends on robust, reproducible data. Although the generation of high-quality data may require challenging and laborious experimental or mathematical work, **we strive to keep our focus on advancing scientific knowledge** rather than on the techniques and protocols that are needed to achieve those goals.

> *To foster curiosity and train future generations of scientists from all backgrounds*

- ✓ **We are committed to training scientists at all career stages** through mentorship and mutual learning
- ✓ **We believe it is more important for students to develop general scientific skills than mastery of specific techniques.** Being a scientist requires so much more than a good pair of “lab hands,” including critical thinking, data analysis, teamwork, and experimental design, imagination, enthusiasm, and constant wonder. We strive to help all trainees cultivate these attributes

> *To provide a safe and welcoming environment for collaborative learning*

- ✓ **We are committed to working together to advance our collective goals.**
- ✓ **We embrace the varied abilities, backgrounds, and perspectives of all lab members** and view diversity as a strength (see the diversity statement on the lab website). We want all lab members to feel safe in their identities and be able to work together for the common good.

What I hope from undergraduate researchers:

> *You will take ownership of your experience*

- ✓ **Appreciate that you are partly responsible for your success.** You should maintain a high level of self-motivation, engagement, scientific curiosity, and ethical standards.
- ✓ **Work to learn the policies of the institute and university.** Comply with all institutional policies, including intellectual property rules, codes of conduct, and laboratory safety protocols.
- ✓ Accept that sometimes **you will feel out of your depth, or maybe convince yourself that you don't belong in science.** This is normal (“imposter syndrome”) and we all feel it sometimes. We hope that you will let your mentor know you feel this or find other ways to push through the feeling. You may also find it useful to seek out career counseling, for example via [SuccessWorks](#).

> *You will be a team player*

- ✓ **Attend and actively participate in laboratory meetings.** In addition to presenting your own work,

you should provide support to others in the lab through constructive questions and shared insights.

Strive to be the very best lab citizen. Take part in shared laboratory responsibilities, completing lab maintenance task, and using laboratory resources carefully and frugally. Maintain a safe and clean workspace. Be respectful, tolerant of, and work collegially with all lab colleagues: respect individual differences in values, personalities, work styles, and theoretical perspectives.

Help other students with their projects, provide feedback, teach them techniques that you have mastered, and provide informal mentorship. Lab research is not a competition!

> ***You will develop strong research skills***

Take advantage of your opportunity by developing and refining your research skills. I do not expect that you will already know how to plan, design, and conduct research when you enter the lab, but I do expect you to work hard and try and gain an understanding of the work from the nitty-gritty of a particular procedure to the broad sweep of the research program.

Nurture a habit of asking questions.

Read any literature that I or your direct mentor assign you. Do your best to understand papers on your own, but always come back to us with questions. There are many good resources out there on how to approach a scientific paper, including [this](#). Don't be afraid to seek out and read papers on your own too!

Maintain detailed, organized, and accurate records of your research. Your notes are needed both to confirm that your results are accurate and to troubleshoot when an experiment does not work. There are many good resources out there on how to keep good lab notebooks, including [this](#). Your notes, records and research data are the property of the lab and should be accessible to your mentor at all times.

> ***You will work to meet deadlines***

Reliable and consistent attendance is expected. It is your responsibility to let your direct mentor know when you will be in lab and also to inform them in advance if you will be unable to come in as planned.

Strive to meet deadlines: this is the only way to manage your progress. It is your responsibility to talk with your direct mentor if you are having difficulty completing your work.

Be mindful of your direct mentor's time constraints. Make sure to use meeting time effectively. Your mentor wants to help you, but the hope is that you will only ask each question once. Taking notes during meetings is a good policy.

> ***You will communicate clearly***

Let us know the style of communication or schedule of meetings that you prefer. If there is something about your mentor's style that is proving difficult for you, please tell them or, if this does not yield an improvement, please inform me so that I can have an opportunity to intervene.

Be prompt. Respond promptly (in most cases, within 48 hours) to emails from anyone in the lab group and show up on time and prepared for meetings. If you need time to gather information in response to an email, please acknowledge receipt of the message and indicate when you will be able to provide the requested information.

Be responsive to advice and feedback. The feedback you get from me or your direct mentor

should help you improve your scientific work. Accepting and learning from feedback is an important life skill. If you are uncomfortable or disagree with the feedback tell your direct mentor or come to me.

Remember that research takes us all out of our comfort zone. If you feel uncertain, overwhelmed, or want additional support, please ask for it. We know these are common feelings and will not judge you for having them.

Ensure that you communicate regularly with your direct mentor. Use those opportunities to make sure that you understand the *what*, the *how*, and the *why* of the research you are helping with.

Provide me with updates on your progress from time to time. Let me know how the experience is going and the challenges that you are facing.

Let us know if our brand of science is not a good fit for you. There is no shame if you conclude that your passions lie outside of science or elsewhere in science domain. Just let us know and we will help you achieve a dignified exit.

> ***You will understand the principles covering authorship and attribution of effort***

All contributions to a research effort will be acknowledged in scientific papers. You should expect to be acknowledged in any paper for which you helped generate data.

Authorship is only rarely earned by undergraduate research assistants. You should not assume that you will achieve authorship for generating data unless you showed particular diligence and creativity in doing so and contributed significantly to the writing of the manuscript. This normally only occurs after multiple years of research experience.

What you can expect from me:

I will work tirelessly for the good of the lab group; the success of every member of our group is my top priority. I will intervene strenuously to ensure that everybody feels safe and welcome.

I will **work with your direct mentor** to help them provide you the quality training and support that you deserve.

If you feel that **you are not getting the support and encouragement you need from your direct mentor**, let me know. I will try and intervene to make things better or find you another mentor.

I will be **available for meetings and informal conversations**. Please let me know if/when you want to meet. I am happy to discuss your research progress or provide feedback and career guidance. Email is a great way to communicate with me, but I do not always respond to emails on weekends as I spent this time with my family.

I will strive to be supportive, equitable, accessible, encouraging, and respectful. I will try my best to understand your unique situation, but I would appreciate you being open and correcting me if I make inappropriate assumptions. I am mindful that we all come from different backgrounds and have different circumstance.