Smith Lab Handbook

This lab handbook outlines the mission, expectations, and policies governing our work in the Smith Lab. All new lab members will be expected to read this document in its entirety and sign our compact in acknowledgement that you have read this document and agree to our policies. Please keep it handy as a reference. This document is not set in stone – it may shift over time - but its purpose is to provide a framework for considering how we learn and work as a collaborative group. It is also designed to help all lab members find answers to questions about expectations, how to do things, etc. If you have suggestions and/or questions outstanding, please let Caroline know! The goal ultimately is for everyone to learn as much as possible, produce high-quality data, and have fun!

This handbook was created by Dr. Caroline Smith and was inspired by and adapted from existing lab manuals – including those of Drs. Annika Barber, Adrienne Antonson, Maureen Ritchey, Miriam Aly, Eva Fischer, Staci D. Bilbo, and the AAMC Mentoring Compact (can be found at the end of this document). It is meant to complement official Boston College policies and procedures. *All Boston College Policies, as well as those of the Psychology and Neuroscience Department take precedence over these.*

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1. Harassment and Discrimination

We take policies regarding Harassment and Discrimination extremely seriously. Dr. Smith is committed to ensuring that the lab is a welcoming and safe environment for all its citizens. We do not tolerate harassment or discrimination of any kind. If you ever have any concerns that you are being harassed or discriminated

against, or notice someone else being harassed or discriminated against, please talk to Dr. Smith as soon as possible. If Dr. Smith is the cause of your concern, please bring your concerns to the appropriate departmental staff. Boston College and Psychology and Neuroscience Department policies can be found here.

2. **Research Ethics and Integrity**

The Smith Lab and Boston College also take a firm stance on research misconduct. **It is absolutely never appropriate to fabricate, falsify, or plagiarize data or written work of any kind**. All Boston College policies on this topic can be found here. Any allegation of this kind will be handled immediately. All lab members will be required to participate in Responsible Conduct of Research Training appropriate to their training level.

Most research misconduct is not committed by "bad actors". It is largely the result of a system that makes people feel incredible pressure to produce and perform to keep their job or career path. If you are ever struggling because you feel as though you are not measuring up, or feel stressed about the progress of your research, please talk to Dr. Smith. It is totally normal to feel uncertain, but that never justifies fabricating or falsifying data. Doing so will only make things much, much, worse, and could destroy your own career as well as those around you. We are in the business of discovering the truth and learning about how the brain works – and all my years in science have taught me that if you focus on that and worry less about the professional outcome, everything works out.

3. **Lab Mission:** The lab mission is our guiding principle that we can always come back to if we need a reminder of why we do what we do. This mission is fluid over time – it will shift as our emphasis changes and should always reflect the shared values and interests of our community.

Smith Lab Mission Statement

To learn and grow as human beings, scientists, and students, in a community that is highly collaborative, inclusive, and open to scientific discourse and creativity.
To work as a team to better understand neuroimmune interactions within the social brain with the long-term goal of providing insight into what goes awry in disorders characterized by social behavior changes such as autism.

4. ***The Smith Lab Compact:***

All members of the Smith Lab will commit to upholding our community agreement to the best of their ability. New lab members, please sign the Compact Form at the end of this document and return it to Dr. Smith within your first week in the lab.

Smith Lab Compact

a. We agree to create, and work actively to maintain, an inclusive and supportive community free from discrimination and harassment *for everyone*. We agree to be **kind**, honest, patient, and considerate with everyone.

b. We agree to assume best intentions and approach all interactions with curiosity and compassion.

c. We agree to show up fully. 80% of success is showing up. We will be fully present at work so that we can be fully engaged while we are here, while protecting our personal lives and identities outside of work. This means doing our best work, and being fully committed and attentive to whatever we are doing (bench work, meetings, etc.). This also means being accountable: being on time, showing up for our commitments, and being responsible for our animals and experiments.

d. We agree to be collaborative. We are a team, and we can achieve the best results by being helpful and supporting each other. Science can feel very competitive, but in reality, teamwork is absolutely *essential*.

e. We agree to take responsibility for ourselves. We will work to be self-reflective and to take ownership of our own career paths, admit our mistakes, and apologize when we need to. Admitting when we have made a mistake can be scary – but it is essential to doing good science! We strive for clear, open communication and the willingness to lean into discomfort to resolve any issues/conflicts that may arise.

f. We agree to fail upwards! Science is always a process of trial and error – we will "fail" often. If you never fail, then you aren't pushing up against your own limits. The important thing is to learn from your failures and try something new and failure-informed the next time.

g. We agree to ask for help when we need it! And ask the question (whatever it is!).

h. We agree to be constructively critical. Science is all about challenging our ideas to see if they hold water. We aim to create an environment in which everyone feels comfortable challenging each other scientifically (including challenging me!). This challenge will always be **KIND** and constructive. This last part is absolutely essential.

i. We agree to conduct honest, open, reproducible science. Plagiarism, forgery, and or data manipulation will not be tolerated. We agree to keep impeccable records of scientific experimentation and to conduct all work with integrity.

j. **We agree to dream big!!** And then break it down into smaller, accomplishable goals. We agree to celebrate our victories (however small) and support each other through the harder moments.

5. Lab Expectations

a) What I expect from all Smith Lab Members: (building on the Compact)

- **Bring your passion and curiosity to your work!** Science is awesome – you get to discover entirely new things with the potential to help the world, and you have a high degree of ownership in the work you do. My #1 goal is to create an environment in which that passion and curiosity can come alive and be fostered. You are all essential to creating and maintaining that environment so please voice your suggestions and push me if you think it can be even better!

- **Work hard and take responsibility for your own scientific and professional journey.** This is a given, in any field. I expect you to do work you are proud of, to be proactive in seeking out opportunities (grants, conferences, training activities, etc), and to take initiative writing papers, grants, doing experiments, etc.). This also means taking responsibility for your experiments! We work with animals and so it is critical that we take seriously the commitment of their lives to our work. It is your mandate to make sure that you conduct your experiments when they need to be done, and to find coverage if you are sick, need to miss something, etc.

- **Take care of yourself.** Science is a marathon, not a sprint. Your wellbeing is a huge priority of the lab! While we may sometimes have to work long hours, we do not glorify workaholism and burn out. Cultivate your life outside of lab and respect that others have personal lives as well. Roughly 40 hours per week on average should be the norm. If you need to come in over the weekend, you can certainly take some hours off during the week to make up for this. Please use your vacation time (as outlined in Section 6b) and follow BC/lab policies for sick time and leave. Please let me know in advance when you will be taking vacation/time away and notify me when you are sick.

- **Adhere to the lab policies sections below.**

- **Show up for your colleagues.** We are all responsible for building our community. Be willing to help your lab mates if they need it. Thank your lab mates when they do help you! Clean up after yourself. Attendance at lab meetings and journal clubs, as well as department events, is mandatory for all lab members – except undergraduate students, and unless it conflicts with important experiments – which will usually take precedence (please discuss with Caroline in advance).

- **Be a little bit obsessive about your work!** This might sound funny, but most of the small errors in science can be avoided by double checking your work! Please work carefully and meticulously. This also goes for professional interactions – please be on time for meetings, and make your presentations, grants, papers, etc. as polished as possible. Make sure that all of your files are organized properly and backed up! If you supervise others in the lab, please check that they are doing this as well.

- **Communicate clearly and directly.** It seems like most issues in any work environment often come down to lack of understanding/communication. I hope that you will communicate directly with each other. I have an open-door policy and I hope that you will come to me if any issues or lab conflicts arise.

    - Communication also applies to deadlines (see deadlines section below). If you need help with experiments/lab work, make sure you ask in advance. If you need me to review papers, grants, abstracts, etc. please let me know at least 1 week in advance (may increase depending on how busy I am with teaching/grants/etc).

    i. What I expect from Undergraduate Students:

    In addition to everything above, I expect undergraduate students to:

    - Assist others with data collection and analysis.
    - Work with your primary mentor (a full-time lab member) to develop a schedule every semester.
    - Work with Caroline and your primary mentor in the lab to develop your project within the larger research of the lab – particularly important for senior/honors thesis students.
    - Present your thesis work at the Psychology Department poster session.
    - Be proactive in looking for opportunities (fellowships, etc).
    - Attend lab meetings and journal clubs if schedules allow (I think you will get a lot out of it!).
    - Don't be shy about bringing all questions, comments, issues, etc. to Caroline and your other mentors in the lab.

    ii. What I expect from Research Assistants:

    In addition to everything above, I expect Research Assistants to:

    - Assist others with data collection and analysis.
    - Help Caroline with ordering and record keeping/protocol making for the lab, as well as financial/logistical management.
    - Work on your own independent project in the lab – typically a fairly large portion of your time!
    - Help Caroline to monitor lab safety and general lab practices.
    - Help to maintain shared lab resources such as google drive, etc.
    - Pick up packages, deliveries, etc.
    - Help with on boarding new lab members.

    iii. What I expect from Graduate Students:

    In addition to everything above, I expect Graduate Students to:

    - Develop a thesis project in concert with Caroline. In general, we aim to meet the 3-paper option in the department and to follow the guidelines in the Psychology and Neuroscience Graduate Program Handbook.
    - Think about your long-term professional goals and talk to Caroline about how you can receive the best possible training to prepare yourself for whatever those goals may be.
    - Keep Caroline well informed about key program deadlines, and work to meet these.

- Prioritize your research! You have many responsibilities as a graduate student, but conducting independent research is the main purpose of a PhD program.
- Mentor undergraduate students in the lab.
- Present your work both within BC, and at conferences. Apply for travel awards whenever possible.
- Apply for grants, including the NSF-GRP and the NIH F31 Fellowships. There are lots of smaller grants that can also be hugely helpful in bolstering your CV!

iv. What I expect from Postdoctoral Fellows:

In addition to everything above, I expect Postdocs to:

- Develop an independent research project – something that you would be excited to build on in your own lab someday should you chose to stay in academia.
- Keep an open dialog with Caroline about your career goals (these may change over time!) so that she can best support you in making them a reality.
- Help to train and mentor students in the lab and share your experience and knowledge with them.
- Apply for grants to support extended time in the lab as well as your work. This would include the NIH F32 Postdoctoral Fellowship and possible a K99 (depending on your career goals).
- Publish your results in a timely fashion and present your work regularly at conferences and at BC.

b) What you can expect from me: (building on the Community Agreement)

- You can (and should!) expect me to adhere to all the overall lab expectations and compact. In addition to the above, you should expect me to:

    - Maintain a clear vision of where research in the lab is going overall and keep projects on track within that scope.

    - Apply for and maintain funding support for our work in the Smith Lab.

    - Manage all the finances of the lab.

    - Take ultimate responsibility for the culture of the lab. I take making sure that the Smith lab feels like a safe and inclusive environment for everyone very seriously. I promise that I will always be trying to make sure of this, and to have an eye out for any issues that arise. Because I am not physically in the lab as often, I hope no one will ever feel afraid to come to me with anything that is bothering them/making them feel uncomfortable – and to let me know if that is not the case.

    - To support each member of the lab as both a whole person and a scientist. My job is to help you succeed to towards your professional goals – whatever those might be – and to

help you find solutions and support if there are personal factors that are impeding your professional progress.

- To provide you with mentorship. This means meeting with you regularly (basis determined depending on stage, needs, etc.). For full-time members of the lab, we will also have yearly meetings to assess progress and goals for the coming year. This also means teaching you how to write academic papers, helping you to design, plan, and conduct experiments, and sharing my perspective on academia and issues related to professional development.

- Promote/build the lab and your work in the larger academic community. This means that I will:
    - present your work (with credit given!) at conferences.
    - build collaborations and relationships with faculty at other institutions.
    - introduce you to people at meetings.
    - Help you to find opportunities to present your work, as well as future job prospects.
    - Write you letters of recommendation.

- Adhere to the Commitments of Research Advisors laid out in the AAMC Compact (see end of document).

6. Lab Policies

a. Lab Attire and Safety

All EHS, IACUC, Boston College policies must be adhered to when working in the lab or in the animal facility. No open toed shoes, or food/drink is allowed in the lab. Lab coats/full coverage clothing should be worn when working with dangerous chemicals. All lab members must complete all EHS and ACF trainings before beginning work in the lab.

No one should be doing anything dangerous (i.e. working with hazardous chemicals, sectioning on the cryostat, etc.) when the building is empty and no one else is around. Undergraduate students should never be doing these things when no one else is in the Smith lab *specifically.* Per ACF policy, undergraduate students are not allowed to work in the animal facility when ACF staff are not present (i.e. not after 6pm on the weekends or 2:30pm on the weekends) unless accompanied by a full-time lab member.

b. Hours, Benefits, and Vacation Policy

I expect full-time lab members (research assistants, graduate students, postdocs) to be in person at work (in the lab, in class, TA-ing, etc.) between at least 10am-4pm most of the time and working the full number of hours for which we are compensated. This is because I feel that I will be best able to mentor you, we will be able to work most effectively as a team, and you will be best able to mentor others if you are coming into the lab regularly. As mentioned above, roughly 40 hours per week on average should be the norm. For graduate students, this includes your time spent in class and on other departmental responsibilities, as well as time spent in the lab. Science can sometimes demand long hours or weekend work. Recognizing this is a critical part of doing

animal-based developmental research (as we do). It is *essential that you make every effort possible to show up for your experiments, rain or shine*. It is also your responsibility to find coverage if you cannot.

That being said, I do not want to promote a work culture where people feel pressure to work more than 40 hours per week. Things ebb and flow – if you work over the weekend or extra late, take the corresponding hours off. Just make sure you keep me posted of when you will be out.

You may have phases in your work when you can work from home/remotely or during off hours. My biggest priority is that you are getting your work done. Working from home will be handled on a case-by-case basis, and only makes sense when you don't have scheduled meetings, experiments, or mentoring responsibilities. During time spent working from the home, the expectation is that you will be available on slack, by email, etc.

There are some restrictions on working odd hours in the lab. No one should be doing anything dangerous (i.e. working with hazardous chemicals, sectioning on the cryostat, etc.) when the building is empty and no one else is around. Undergraduate students should never be doing these things when no one else is in the Smith lab *specifically.* Per ACF policy, undergraduate students are not allowed to work in the animal facility unless ACF staff are present (i.e. not after 6pm on the weekends or 2:30pm on the weekends) unless accompanied by a fulltime lab member.

Vacation time should be used! Graduate students are entitled to two weeks of vacation per year, as well as the week between Christmas and New Year (unless experiments are running). Research Assistants and Postdocs vacation time is accrued and set according to BC policy – but in general, the same applies as for graduate students. Please let Caroline know of any vacation plans at least two weeks in advance, make sure it doesn't conflict with experiments you have planned, and is marked on the Smith lab calendar. Everyone should be able to celebrate their religious holidays, so please talk to Caroline if those differ from BC's observed holidays.

Sick leave is also accrued according to official BC policies, as are policies for extended leave, parental leave, and disability policies.

c. Data Management

Data management is ESSENTIAL to doing academic research. Our work is supported by millions of taxpayer and private dollars. It is imperative that we take that seriously. It is everyone's responsibility to take detailed notes and keep meticulous records of their experiments. Please make sure that all notes are taken in a proper lab notebook – which means one with pages that don't tear out, and that all notes include the date, your name, and what the experiment was. If you are storing records in your drive folder, make sure that all files are similarly labeled so that someone with no prior knowledge of the experiment would know what they were relevant to. All research related materials should be made and stored directly within the shared Smith Lab google Drive so that no data is at risk of being lost! If you are supervising someone else in the lab, it is your responsibility to check their work on this sort of thing. Please save all files as excel sheets in the google drive – not google sheets – so that they can be transferred across platforms.

All raw data (video files, imaging files, etc.) should be saved in two places (for example on the Smith Lab server and the Smith lab shared drive) immediately after it is collected. There could be very serious repercussions down the line if raw data is not readily available or is lost.

d. Authorship

We follow the APA Guidelines for authorship credit:

"Authorship credit should reflect the individual's contribution to the study. An author is considered anyone involved with initial research design, data collection and analysis, manuscript drafting, or final approval. However, the following do not necessarily qualify for authorship: providing funding or resources, mentorship, or contributing research but not helping with the publication itself. The primary author assumes responsibility for the publication, making sure that the data are accurate, that all deserving authors have been credited, that all authors have given their approval to the final draft; and handles responses to inquiries after the manuscript is published."

When beginning a new project, the trainee leading the project can expect to be the first author on that work – and this will be discussed explicitly at the start. Caroline will usually be the last author. Other lab members who assist with the project should expect to be made co-authors on the paper. Author order will be discussed with all authors when the manuscript is being prepared. Authorship should be revisited throughout the lifespan of a project. Things can change over time given that projects can take unexpected turns, effort can change over time, and new collaborations can be introduced. Please come to Caroline if you have any questions about authorship, or if conflicts around authorship arise. Particularly for something as sensitive as this, open and frequent communication is key!

If you leave the lab with unpublished work and you are staying in an academic path, it is expected that you will continue to see that work through the publication process. If you are transitioning to a different career, or if you do not wish to complete the publication process, this work will be transferred to someone else in the lab to finish. In this case authorship order will be revisited depending on the amount of work left to be done, etc.

e. Deadlines and Recommendation Letters

Please stay on top of deadlines you need to meet and give me at least **1 weeks' notice** (two weeks is better!) for anything you need me to look over, give you feedback on, etc. At very busy times, I may ask that you let me know even further in advance.

Letters of recommendation are critical, and you can always expect me to provide these for you – even after you have left the lab. Please give me at least **2 weeks' notice** of any letters you need me to write, and provide an up-to-date copy of your CV, the instructions for submitting the letter, and any addition needed materials in the form of an email.

f. Travel to conferences

Attending conferences is a fun and enriching experience and my goal is to support everyone in attending as often as possible. For undergraduate students and research assistants, this is not guaranteed, but may be possible depending on funds and whether there is sufficient data for a cohesive poster. For graduate students and postdocs, you can expect that I will support your attendance to at least one national conference per year (assuming that the lab funds are available), maybe more if funds allow. All available funding through the Psychology

and Neuroscience Department, as well as the Graduate School of Arts and Sciences, should be availed of first. I expect that you will keep costs as reasonable as possible and that you will find a roommate for hotel stays (from within the lab/department or the conference websites, etc.). It can be a large financial burden to have to cover travel costs up front as a graduate student. Please talk to Caroline if this is an issue and we can always find some way to work it out. I encourage all members of the lab to apply for any travel awards for which they are eligible – including undergraduate students. Travel awards look great on your CV and can provide added opportunities to attend more meetings in more cool places! Obtaining extra funding - either as a part of larger grants or through travel awards – can also provide the opportunity to attend international conferences and more expensive workshops, etc.

7. Lab Resources

Google Drive: Detailed protocols for new lab members, as well as experimental protocols and instructions for accessing Smith Lab resources, can be found in the Smith Lab Shared Google drive. All new lab members will be added to the Smith Lab Shared Drive and expected to use it exclusively for creating and storing all their work. This should be done by downloading the Google Drive desktop app and using it like a regular documents folder (rather than for example creating google documents online).

Slack: Most day-to-day communication will be conducted via Slack. All members of the lab are expected to respond in a timely manner to slack messages during normal work hours. As a note, all slack messages/files are deleted after 90 days! So, if something is shared with you, please save it immediately so that you don't lose it!

Trello: Full-time lab staff will be added to the Smith Lab Trello. We use Trello for project management and to keep track of weekly to-do lists, progress, etc.

8. Boston College Resources

Boston College Employee Handbook

Boston College Postdoctoral Policy

Boston College Psych & Neuro Graduate Program Wiki

Smith Lab Compact

k. We agree to create, and work actively to maintain, an inclusive and supportive community free from discrimination and harassment *for everyone*. We agree to be **kind**, honest, patient, and considerate with everyone.

l. We agree to assume best intentions and approach all interactions with curiosity and compassion.

m. We agree to show up fully. 80% of success is showing up. We will be fully present at work so that we can be fully engaged while we are here, while protecting our personal lives and identities outside of work. This means doing our best work, and being fully committed and attentive to whatever we are doing (bench work, meetings, etc.). This also means being accountable: being on time, showing up for our commitments, and being responsible for our animals and experiments.

n. We agree to be collaborative. We are a team, and we can achieve the best results by being helpful and supporting each other. Science can feel very competitive, but in reality, teamwork is absolutely *essential*.

o. We agree to take responsibility for ourselves. We will work to be self-reflective and to take ownership of our own career paths, admit our mistakes, and apologize when we need to. Admitting when we have made a mistake can be scary – but it is essential to doing good science! We strive for clear, open communication and the willingness to lean into discomfort to resolve any issues/conflicts that may arise.

p. We agree to fail upwards! Science is always a process of trial and error – we will "fail" often. If you never fail, then you aren't pushing up against your own limits. The important thing is to learn from your failures and try something new and failure-informed the next time.

q. We agree to ask for help when we need it! And ask the question (whatever it is!).

r. We agree to be constructively critical. Science is all about challenging our ideas to see if they hold water. We aim to create an environment in which everyone feels comfortable challenging each other scientifically (including challenging me!). This challenge will always be **KIND** and constructive. This last part is absolutely essential.

s. We agree to conduct honest, open, reproducible science. Plagiarism, forgery, and or data manipulation will not be tolerated. We agree to keep impeccable records of scientific experimentation and to conduct all work with integrity.

t. **We agree to dream big!!** And then break it down into smaller, accomplishable goals. We agree to celebrate our victories (however small) and support each other through the harder moments.

I, _____ , hereby agree that I have read the Smith lab compact and manual and commit to upholding lab culture and policies to the best of my ability.

Signed:_____ Date:_____

AAMC

Tomorrow's Doctors, Tomorrow's Cures®

Compact Between Biomedical Graduate Students and Their Research Advisors

A framework for aligning the graduate student mentor-mentee relationship

January 2017

Association of
American Medical Colleges

The following members of the compact review team are gratefully acknowledged for their contributions to this update:
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The AAMC is a not-for-profit association representing all 147 accredited U.S. medical schools, nearly 400 major teaching hospitals and health systems, and more than 80 academic and scientific societies. Through these institutions and organizations, the AAMC represents nearly 160,000 faculty members, 83,000 medical students, 115,000 resident physicians, and thousands of graduate students and postdoctoral trainees in the biomedical sciences.

To download this document, go to www.aamc.org/gradcompact.

Introduction

The *Compact Between Biomedical Graduate Students and Their Research Advisors* presents guiding principles intended to support the development of positive mentoring relationships between predoctoral students and their research advisors. A successful student-mentor relationship requires commitment from the student, mentor, graduate program, and institution. This document offers a set of broad guidelines that are meant to initiate discussions at the local and national levels about the student-mentor relationship.

There are several potential uses for this document. Among those suggested are the following:

- As a starting point for discussions between predoctoral students, research advisors, and institutional administrators about the issues addressed by the compact
- As part of the orientation for new predoctoral students
- As part of a regular and ongoing discussion between predoctoral students and their research advisors
- As a source of topics to be discussed in graduate research programs
- As a part of the orientation for new research faculty
- As a source of topics to be discussed in faculty mentorship programs
- As a component of faculty evaluations
- As a tool to initiate the development of additional programs and support services for predoctoral students within a graduate research program

This compact was originally drafted in 2008 in collaboration with representatives of the AAMC Group on Graduate Research, Education, and Training (GREAT Group) and is modeled on the AAMC's *Compact Between Postdoctoral Appointees and Their Mentors*, available at www.aamc.org/postdoccompact. Input on this document was received from GREAT Group representatives and members of the AAMC governance. The document was endorsed by the then AAMC Executive Council on September 25, 2008. In 2016, a team consisting of representatives from the GREAT Group and the AAMC Council of Faculty and Academic Societies (CFAS) reviewed and updated the document. The GREAT Group, CFAS, and AAMC staff leadership provided input on the revised draft.

Compact Between Biomedical Graduate Students and Their Research Advisors

Predoctoral training entails both formal education in a specific discipline and research experience in which the graduate student trains under the supervision of one or more investigators who will mentor the student through graduate school. A positive mentoring relationship between the predoctoral student and the research advisor is a vital component of the student's preparation for future careers and mentoring roles.

Individuals who pursue a biomedical graduate degree are embarking on a path of lifelong learning and are therefore expected to take responsibility for their scientific and professional learning and development from the onset. Graduate students must be in charge and take ownership of their progress through the graduate program. This means seeking guidance on and knowledge about course requirements and program requirements, policies, and procedures. Students must also commit to working on an individual development plan. Faculty members who advise students—with the backing of the graduate program and institution—are expected to fulfill the role of mentor, which includes providing scientific training, guidance, instruction in the responsible conduct of research and research ethics, and financial support. The faculty advisor also serves as a scientific and professional role model for the graduate student. In addition, the advisor offers encouragement as the graduate student prepares an individual development plan and facilitates the experiences and professional skills development essential for a broad set of career paths.

Core Tenets of Predoctoral Training

Institutional Commitment

Institutions that train biomedical graduate students must be committed to establishing and maintaining rigorous graduate programs with the highest scientific and ethical standards. Institutions should work to ensure that students who complete their programs possess the foundational knowledge, skills, and values that will allow them to mature into scientific professionals of integrity. They should have oversight of the graduate curricula, length of study, stipend levels, benefits, career guidance, grievance procedures, and other matters relevant to the education of biomedical graduate students (e.g., consideration of, preparation for, and exposure to various career paths). Institutions should recognize and reward their graduate-training faculty. With changing and diversified biomedical workforce needs, institutions should recognize the necessity of faculty development around multiple career paths for trainees and provide opportunities for faculty to acquire such skills and experiences. Additionally, institutions should also foster an environment that is diverse and inclusive.

Program Commitment

Graduate programs should establish training that prepares students with broad and deep scientific knowledge and the technical, professional, and leadership skills necessary for a successful career in the biomedical sciences. Programs should closely monitor the progress of graduate students during their course of study by establishing milestones and clear parameters for outcomes assessment, as well as maintain and make available career outcomes data.

Quality Mentoring

Effective mentoring is crucial for graduate school trainees as they begin their scientific careers. Faculty mentors must commit to dedicating substantial time to the scientific, professional, and personal development of the graduate student. Whether a faculty member acts as the primary research advisor or sits on a student's advisory committee, a relationship of mutual trust and respect between mentor and graduate student is essential for healthy interactions and to encourage individual growth. Effective mentoring should include teaching the scientific method, providing regular feedback in the form of both positive support and constructive criticism to foster individual growth, teaching the "ways" of the scientific enterprise, and promoting careers by providing or directing students to appropriate opportunities. The best mentors are careful listeners who actively promote and appreciate diversity. They possess and consistently maintain high ethical standards, acknowledge and recognize the contributions of students—in publications and intellectual property, for example—and have a record of research accomplishments and financial support. Finally, it should be recognized that mentoring does not end with a student's completion of the graduate program but continues throughout the student's professional life.

Skill Sets and Counseling for a Broad Range of Career Choices

The institution, training programs, and mentor should provide training relevant to a broad variety of careers that will allow graduate students to appreciate, navigate, discuss, and develop career choices. Effective and regular career guidance activities should be offered.

Commitments of Graduate Students

- **I acknowledge that I have the primary responsibility for the successful completion of my degree.** I will be committed to my graduate education and will demonstrate this by my efforts in the classroom, the research laboratory, and all other related academic and professional activities. I will maintain a high level of professionalism, self-motivation, initiative, engagement, scientific curiosity, and ethical standards, including complying with institutional and research group standards for contributing to an inclusive research environment.

- **I will meet regularly with my research advisor to provide updates on the progress and results of my course work, research, and professional and career development activities.**

- **I will work with my research advisor to develop a thesis/dissertation project.** This will include establishing a timeline for each phase of my work. I will strive to keep engaged with the work, discuss experimental findings and any pitfalls, and meet the established goals and deadlines.

- **I will work with my research advisor to select a thesis/dissertation committee.** I will commit to meeting with this committee at least annually (or more frequently, according to program guidelines). I will discuss my progress to date and be responsive to the advice and constructive criticism from my committee.

- **I will be a good lab citizen.** I agree to take part in shared laboratory responsibilities and will use laboratory resources carefully and frugally. I will maintain a safe and clean laboratory space. I will be respectful of, tolerant of, and work collegially with all laboratory personnel. I will be an active contributing member to all team efforts and collaborations and will respect individual contributions. I will also contribute to an environment that is safe, equitable, and free of harassment.

- **I will maintain detailed, organized, and accurate research records. With respect to data ownership, I acknowledge that original notebooks, digital files, and tangible research materials belong to the institution and will remain in the lab when I finish my thesis/dissertation so that other individuals can reproduce and carry on related research, in accordance with institutional policy.** Only with the explicit approval from my research mentor and in accordance with institutional policy may I make copies of my notebooks and digital files and have access to tangible research materials that I helped to generate during my graduate training.

- **I will discuss policies on work hours, medical leave, and vacation with my graduate program and research advisor.** I will consult with my advisor in advance of any planned absences and apprise my advisor of any unexpected absences due to illness or other issues.

- **I will discuss policies on authorship and attendance at professional meetings with my research advisor.** I will work with my advisor to disseminate all relevant research results in a timely manner before completion of all degree requirements.

- **I will be knowledgeable of the policies and requirements of my graduate program, graduate school, and institution.** I will commit to meeting these requirements in the appropriate time frame and will abide by all institutional policies and procedures.

- **I will attend and actively participate in laboratory meetings, seminars, and journal clubs that are part of my educational program.** To enhance research, leadership, and additional professional skills, I will seek out other enrichment opportunities, such as participation in professional organizations and meetings, student representation on institutional committees, and coordination of departmental events.

- **I will be knowledgeable of all institutional research policies.** I will comply with all institutional laboratory safety practices and animal-use and human-research policies. I will participate in my institution's Responsible Conduct of Research Training Program and practice the guidelines presented therein while conducting my research. I will also seek input on and comply with institutional policies regarding my research design and data analysis.

- **I acknowledge that I have the primary responsibility for the development of my own career.** I recognize that I need to explore career opportunities and paths that match and develop my individual skills, values, and interests to achieve my desired career goals. I understand that there are tools such as the individual development plan that I should use to help me define my career goals and develop my training plan. I will seek guidance throughout my graduate education from my research advisor, career counseling services, thesis/dissertation committee, other mentors, and any other resources that can offer advice on career planning and the wide range of opportunities available in the biomedical workforce.

Commitments of Research Advisors

- **Throughout the graduate student's time in my laboratory, I will be supportive, equitable, accessible, encouraging, and respectful.** I will foster the graduate student's professional confidence and encourage intellectual development, critical thinking, curiosity, and creativity. I will continue my interest and involvement as the student moves forward into a career.

- **I will be committed to meeting one-on-one with the student on a regular basis. I will regularly review the student's progress and provide timely feedback and goal-setting advice.**

- **I will be committed to the graduate student's research project.** I will work with the student to help plan and guide the research project, set reasonable and attainable goals, and establish a timeline for completion of the project.

- **I will help the graduate student select a thesis/dissertation committee.** I will assure that this committee meets at least annually (or more frequently, according to program guidelines) to review and discuss the graduate student's progress and future directions. I understand that the function of this committee is to help the student complete the doctoral research, and I will respect the ideas and suggestions of my colleagues on the committee.

- **I will provide an environment that is intellectually stimulating, emotionally supportive, safe, equitable, and free of harassment.**

- **I will demonstrate respect for all graduate students as individuals without regard to gender, race, national origin, religion, disability or sexual orientation, and I will cultivate a culture of tolerance among the entire laboratory.**

- **I will be committed to providing financial resources, as appropriate and according to my institution's guidelines, for the graduate student to conduct thesis/dissertation research.** I will not require the graduate student to perform tasks that are unrelated to the training program and professional development.

- **I will expect the graduate student to share common laboratory responsibilities and use resources carefully and frugally.** I will also regularly meet with the graduate student to review data management, storage, and record keeping. I will discuss with the student intellectual policy issues regarding disclosure, patent rights, and publishing research discoveries.

- **I will discuss with the graduate student authorship policies regarding papers.** I will acknowledge the graduate student's scientific contributions to the work in my laboratory, and I will provide assistance in getting the student's work published in a timely manner.

- **I will be knowledgeable of and guide the graduate student through the requirements and deadlines of the graduate program and the institution, as well as teaching requirements, if any, and human resources guidelines.**

- **I will encourage the graduate student to attend and present their research at scientific/professional meetings and make an effort to secure and facilitate funding for such activities. In addition, I will provide opportunities for the student to discuss science and their research findings with colleagues and fellow scientists within the institution and broader scientific community—for example, at lab meetings, research days, and seminars.**

- **I will promote the training of the graduate student in professional skills needed for a successful career. These skills include but are not limited to oral and written communication, grant writing, management and leadership, collaborative research, responsible conduct of research, teaching, and mentoring.** I will encourage the student to seek opportunities to develop skills in other areas, even if not specifically required by the student's program. I will also encourage the graduate student to seek input from multiple mentors.

- **I will create an environment in which the student can discuss and explore career opportunities and paths that match their skills, values, and interests and be supportive of their career path choices.** I will be accessible to give advice and feedback on career goals. I will work with the student on an individual development plan to help define career goals and identify training milestones. I will provide letters of recommendation for the student's next phase of professional development.

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