Introduction

This document is intended to provide you with some orientation regarding policies within the Feig Lab. It will provide a framework for our initial discussion regarding my expectations of you as a trainee and to ensure complete and open communication.

The Ph.D. degree is not one that has a fixed length of time. Some people complete their degree in as little as 4 years whereas others take substantially longer. The time it takes to obtain a degree from the laboratory is dependent on many factors, including but not limited to: A) the type of project you are doing; B) how hard you work; C) how good your hands are experimentally; and D) how lucky you are. Typically, you should be thinking in terms of having at least three data chapters in your thesis plus an introductory chapter that is a review article about your field. In terms of papers, that would normally constitute three first author articles (not communications), one representing each chapter of your thesis. This criterion is not a hard and fast rule but more of a general guideline, and the makeup of your thesis will be something we discuss as you progress through graduate school. The decision regarding when to write and defend your thesis will be made in conjunction with your thesis committee and me as we look at the body of work you accomplish. Remember that a Ph.D. is a research degree. Conferring it on someone indicates that they have reached the highest levels of mastery in their field. It implies that you not only have become an expert in your subject, but that you also have the proven ability to contribute substantial and important new knowledge to the discipline. This intense period of laboratory work will result in a transformation in the way you think about problems, demonstrating that you can identify unanswered questions, design the experiments necessary to answer them, and interpret the results in light of the existing knowledge in the field.

Specific Expectations of Trainees

- **Laboratory safety**

  Laboratory safety is everyone's responsibility. There are chemicals, biological specimens and equipment in the laboratory that can be hazardous, to yourself or to others. If you are unsure of the safety precautions that need to be taken when working with something in the lab, please ask for additional guidance. Particular care must be taken with radioisotopes and Biosafety materials. If you have a small spill, immediately notify anyone in the lab if there is a hazard and proceed to clean it up if possible. If the spill is too large to take care of personally, you should follow the protocols outlined in the laboratory safety manual including calling EH&S for assistance if it is during business hours, or calling Public Safety if it is after hours. Always call public safety if there is a significant personal injury. Please notify me immediately on my cell phone (248-231-4453) if there is a serious accident or spill in the laboratory and I am not around.

- **High quality science**

We strive to produce science that is rigorous and of the absolute highest quality. We have high standards and make no apologies for that. I expect that you will not cut corners and that you will be forthright in presenting your data, even when it does not fit neatly into a current model. Experiments in biochemistry often live and die based on their controls. Strive to think of the necessary controls prior to doing an experiment as it will save having to go back and repeat things over and over again. Also, be critical of your own experiments and learn to put your results into the context of the field.

- **Laboratory Notebooks and Records (written and electronic)**

It is imperative that you maintain a neat and accurate notebook of your laboratory activities. The maintenance of high quality laboratory records is essential to the on-going productivity of the laboratory. Everyone in the lab uses the same style of bound notebook (a stock of empty notebooks are usually kept on hand) and entries should be written in ink, not pencil. Each notebook needs to be numbered and dated to indicate where it lies with respect to the series. These notebooks are the permanent record of your work. The notebook must be a complete record of your work as it was actually carried out, not based on idealized plans of an experiment. My suggestion is that you plan experiments on a legal pad or a spiral binder rather than in your notebook. If something changes while you are performing the experiment, note it on the experimental plan. Then, once the procedure is done, enter it into the notebook based on what actually happened. For instance, you might have planned on letting something incubate for only 15 minutes, but got distracted by a phone call and the actual incubation was 30 minutes. What needs to be recorded is that it went 30 min. and potentially a note that it was supposed to be 15 min. This latter statement will keep the future protocol on track and prevent a mistake from being perpetuated into the future.

There is a tendency among students to postpone writing their lab notebooks. I urge you to keep up in this task and not put it off. All of our memories are fallible and the longer we wait before writing down the record of our work, the greater the chance that the record itself will become flawed – not intentionally, but because you forget some small detail that later turns out to be critical. The simplest solution is to keep up with your note taking so that the lab notebook is completed as soon as the experiment is done.

What must go into your notebook? The notebooks must be sufficiently detailed that another student or I can both understand and reproduce your experiments exactly as you performed them. This is critical because if someone from outside the lab were to question a result of yours after you leave the group, we must be able to repeat the experiments. Your notebooks are a source of procedures and protocols that you or other members of the group can refer to as necessary. All experiments should have titles and dates. It helps to include a description of the experiment and why you are doing it. My suggestion is that

experimental procedures themselves be written in recipe style rather than prose for ease of finding the necessary information rapidly. Data should be annotated and fully interpreted at the end of each experiment. If there are computer files associated with your experiment, the names of the files should be written in the notebook. Backup copies of all of your computer files on CD-R or DVD-R should be made regularly and will ultimately be kept with your notebooks. If data are reanalyzed at a later date, you should indicate in the notebook the page where the new analysis has been recorded and that it supercedes the previous discussion.

Part of maintaining these notebooks also includes making it easy to find information in them. You are to include a table of contents at the beginning of each laboratory notebook. Toward that end, I recommend that you leave the first 8 or so pages of each notebook blank to be filled in with that table of contents. There should be no lose papers that could get lost as part of your notebooks. All supporting data should be taped or stapled into place as a part of the permanent record (no paper clips). If there are three ring binders of supplemental data, those need to be annotated in a manner that makes it simple to connect the paper copies to the write-ups of the experiments.

Laboratory notebooks and all of the data you collect while you are a member of the lab are the property of the lab. Notebooks and backups of all computerized data files are to be returned in their entirety upon leaving the lab. You are strongly encouraged to photocopy your notebooks at the end of your tenure in the lab so that you retain a copy of them as well as any and all electronic data you might have collected. This serves two purposes. First, it will let us communicate effectively about your data after your departure from the lab. Second, where there ever a fire or flood in the laboratory, your copy would serve as a backup of these valuable records. Notebooks are to be stored in the lab or at your desk. Notebooks may be taken home on a nightly basis in order to do your recordkeeping, but are to be immediately returned to the laboratory the following day. They are to be available for inspection at any time.

If you do not keep accurate written records of your experiments, the experiments might as well not have been done. Your notebook is a legal document and must be maintained with great diligence. It is required by federal law that all work performed under contract with the NIH or NSF (i.e. our grants), be documented in a manner that can withstand an audit of the primary data. Also, if your data were to be patented and later challenged, your notebooks would document when the work was performed and the progression of the understanding that led to the claims in the patent. Please take your recordkeeping duties seriously.

- **Work ethic**

I expect people to work hard in the lab. I do not hold co-workers to a specific number of hours per week that one must work. One person might be in the lab 80 hours/week, but spend most of that time getting nothing done other than surfing the web. Another person will be in the lab for 40 hours/week and be

on task that entire time. Productivity is more important than total hours. That said, a productive person who works 60 hours/week will get more done than an equally productive person who only works a 40 hour week. Hard work is a major contributor to success in graduate school. I do not require that you work a specific schedule during the day. I do ask that you overlap significantly with my day and the professional staff of the department. It is necessary for you to interface with the folks that help you purchase lab supplies and with me if you are to get guidance on your project. Thus, you should not expect to work the night shift indefinitely. Certain experiments might require you to temporarily monopolize access to a specific piece of laboratory equipment. Under those circumstances, I certainly understand working off-hours, but that should not become a standard schedule for indefinite periods of time.

- **Read the literature**

Get in the habit of reading the literature. My recommendation is to read broadly during graduate school. If you have downtime between experiments, it is the perfect time to keep your laboratory notebook up to date and to read journal articles. There is a clear correlation between voracious reading and success in graduate school. That is not to say that you should always be reading and never doing experiments, because that is also not productive. If you do not read the literature, however, you will not know how to do the right experiments nor will you be able to interpret and discuss your results in light of the work on-going in other laboratories. During graduate school, you will leave textbooks behind. They are not sufficiently advanced to provide you with the insights you will need to have in general. You will gradually shift to obtaining your understanding from review articles, primary literature and conversations about science with your colleagues.

- **Cooperate with your colleagues**

I do not require that you become best friends with your colleagues in the lab, but a congenial and respectful atmosphere is essential. Your lab mates are your peers and there is much that you can and will learn from them. You will be expected to work side-by-side with these people and it is important that you maintain a professional working environment. This includes keeping common spaces in the office and laboratory clean so that others can get their work done and keeping laboratory equipment in proper working order. Everyone must pitch in to the shared chores in the laboratory to ensure that everyone can get their work done efficiently. If interpersonal issues develop that make it hard to work side-by-side with a colleague, especially due to inappropriate conduct of some sort, proper channels of communication need to be maintained. I try not to micromanage the social interactions in the laboratory but I will be forced to intercede if inappropriate behavior is involved such that it makes someone in the laboratory feel uncomfortable. Serious violations of professional conduct should be brought to me immediately.

- **Care of laboratory equipment and property**

  Please treat the equipment in the laboratory with due care. Some of the instruments are sensitive and/or fragile and can be easily damaged by misuse. If you do not know how to use an instrument, please seek instruction from me or from a senior member of the laboratory. Most major pieces of equipment have logbooks next to them and some have sign up sheets. Please be diligent about logging use. These logs allow us to track when problems first crop up and are essential records for the maintenance and repair of the equipment. Practically every major piece of equipment in the laboratory has been assigned to someone in the lab for oversight. This person is responsible for helping to train new users as necessary and for facilitating maintenance if the instrument breaks. Typically, these assignments make sense because the person in charge of the instrument is also a significant user of it. A list of the current lab duty assignments is posted in the lab. If you discover an item is broken, please notify the person in charge of the instrument and note the issue it in the logbook as appropriate.

- **Communal chores/laboratory responsibilities**

  We strive to keep the level of menial tasks to a minimum, but there are a certain number of chores that must be done to keep the lab functioning smoothly. These tasks are divided approximately equally among all lab members. It is expected that you will maintain any equipment that has been assigned to you and perform these tasks diligently.

- **Nuclease and nuclease contamination**

  Please be cognizant of those around you. One particular area that mutual respect is important has to do with protecting the lab from outbreaks of nuclease contamination. A large fraction of the laboratory works with RNA. These RNAs are particularly sensitive to nucleases and these nucleases are present on our skin. In many cases, improperly handling communal equipment (such as the water purification system) can lead to the disruption of many people's experiments. So, with that said, we take a number of precautions to avoid inappropriate contamination of equipment or reagents. Wear gloves to avoid spreading nucleases. Do not use other people's pipets without first obtaining their permission. Handling pipets without gloves is an especially easy way to contaminate your bench or your samples. If the nucleases get on your gloves and then you open the tube containing your precious RNA, it can become contaminated. If you give someone a sample, aliquot it such that you provide them with what they need but do not expect any left over material to be returned. Take special care when using common stocks or shared enzymes. If you contaminate those tubes, it may take the lab several days to track down the source of the problem. During that time, no one will be making progress toward their experimental goals. The best way to avoid these problems is to consider every sample to be precious and treat it as if it were sterile. Also be aware of

where you put things. Try not to put dirty objects on someone's bench that might contaminant their work space. Specific work such as that with nucleases and crude cells will typically be done in the cell room to prevent cross contamination of the benches and pipetmen.

- **Data ownership and intellectual property**

Data ownership and intellectual property rights are spelled out by agreements with the University. Essentially, the laboratory and Wayne State University owns the data and the intellectual property that might result from our work. As a potential "co-inventor", you have certain rights and responsibilities, however. When you leave the laboratory, you will be required to leave behind all documentation of your work. You are entitled and encouraged to keep photocopies of your notebooks as a permanent record of your experiments.

The work in the laboratory is intended for publication in the scientific literature. There is the expectation that everyone who makes an intellectual contribution to a body of work will be listed as a co-author on a paper. As we begin to frame a paper, we will discuss who should be listed as co-authors and reach a consensus among the relevant people who contributed to the work.

- **Lab Meetings**

Attendance and participation in the weekly lab meetings is mandatory for everyone in the lab. Schedules for the presentations are organized in the fall, winter and summer and fall into two general categories – research and literature. Research group meetings include presentations on your recent results. They are works in progress and are meant to help everyone see where you are going and contribute their insights into all of the projects on-going in the lab. They are times for us to analyze experiments to ensure that they have been executed effectively, to review data and data interpretation to make sure that nothing has been missed, to evaluate progress toward research goals and to set new goals for the next period. They are also a time to teach newer members in the group about the techniques that are being used in the lab and the tricks that make the experiment work better. Literature group meetings involve presentation of recent primary literature to the group that is related to your research project. At the beginning of your tenure in the lab, you will be asked to clear potential papers with me prior to presenting, but later on, you will be given free reign to select papers on your own. Group meetings are to be taken seriously. They are a time when you can hone your presentation skills and the art of preparing visual aids for seminars. When you are listening to these presentations, please feel free to comment on the work and participate in the discussions. If you disagree with the interpretation, say so politely. If you do no understand the methodology, ask. This is your opportunity to learn and for whoever is presenting to teach others about their work. Group meetings are the venue in which you will learn to give a good talk and to become proficient in the art of communicating science to others.

- **Year End Reports**

  With the exception of your first year in the laboratory, you will be expected to complete a year-end report in December prior to the winter holidays. Exact dates will be set forth each year well in advance of the actual due date. We will sit down shortly thereafter and have a conversation about that report and your research progress.

- **Vacation time**

  Everyone needs some time off during the year, either to take care of chores, have a doctor's appointment or to take a short vacation. The formal lab policy is that you have 3 weeks (15 days) off during the course of the year, in addition to the formal university holidays (New Year's Day, Christmas, Day, Thanksgiving, etc.). You may use this time at the holidays or at other times of the year at your discretion. You are to ask approval no less than 1 week in advance that you wish to take time off. When considering your vacation time, you should also keep in mind your experiments. Depending on your specific project, shutting down for a few days may cause more or less disruption. In general, so long as you are maintaining your productivity, I will not harass you about time off. If you abuse the flexibility or are not making forward progress, I might start to ask questions or clamp down.

- **Ethical Conduct**

  I take research ethics very seriously. Toward that end, in the fall we usually schedule a group meeting to talk about ethics issues through the use of case studies. We further use this as an opportunity to go over lab policies regarding research ethics. I have a zero tolerance policy for academic misconduct. If you are found to have fabricated data or intentionally withhold data that refutes a central thesis in your work, that will be grounds to immediately ask you to leave the laboratory and potentially graduate school. I must be able to trust everyone working in the lab to conduct them self in an appropriate manner. If you violate that trust, I will not be comfortable being your mentor or supporting you in your future endeavors.

  Data fabrication is an obvious no, no. There are many more grey areas of research misconduct. If you are uncertain regarding how to proceed in any such area, the solution is usually to have a frank conversation with all people involved. Open communication is often the first step toward finding an appropriate solution.

- **Open Door Policy**

  I take my role as your advisor very seriously. I strive to give you the advice and guidance you need to succeed while also giving you the freedom and flexibility to explore your talents on your own. You will often learn more from trying to figure something out on your own rather than being told in microscopic

detail exactly how to do something. I try to balance these opposing forces. You will need to develop your scientific independence prior to graduation, but everyone evolves at a different rate. I strive to be as accessible as possible to everyone in the laboratory. The goal is to teach you to be self-directing, but few students enter the lab at that stage from day one. If you need assistance or guidance, my door is always open. Your experiments will not always work and I understand that. When they are working, I love to see your newest data and you should feel free to come share it with me. When they are not working, come get advice on how to trouble shoot them. No two students want the exact same thing out of the advisor-advisee relationship. Some want to work through problems on their own. Others want to be guided more thoroughly through the bumps and turns. I am here to help you succeed to the best of your abilities and you should feel free to let me know if you feel that you are not getting the guidance you need to continue developing as a scientist. It is a privilege to watch your skills evolve and to be part of your scientific development and I will take great pride in being part of your future success.

My signature below indicates that I have received and read a copy of this document and had the opportunity to discuss it with my mentor.

_____ _____

Signature of Student date

_____

Printed Name

_____ _____

Signature of Advisor date

_____

Printed Name