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August 12, 2014

Welcome to the Section on Molecular and Cell Biology (SMCB) in the Laboratory of Molecular Growth Regulation (LMGR) in the Intramural Research Program in Genomics of Differentiation (PGD), of the NICHD.

The purpose of this communication is to transmit important information that I feel will contribute to your success here and beyond. The foremost objective of the fellows program is to provide you with top-notch scientific training while you contribute to the goals of the SMCB program and advance your career. Your training will be broadly based within the realm of Molecular Biology, Biochemistry and Genetics. It will be achieved through your own work as well as that of other members of our group, other LMGR-PGD members and associated colleagues whose work and experiences you are also expected to learn from. As you read through this please keep in mind that it was prepared to be directed to a group of Fellows with a wide variety of backgrounds and training. Although I believe that everything in this document may be applicable to you, some things may apply more or less to you than to others, i.e., to different degrees.

In addition to learning how to choose, design and expedite new experiments, an important goal for you should be to develop excellent communication skills that will promote your advancement in biomedical science. This involves becoming a contributor who can present his/her own work, and a listener who can offer constructive criticism. Thus, participation in data clubs, seminars, and abstract and manuscript preparation, as well as journal and manuscript reviews will constitute an important part of your training.

This communication provides you with guidance as to what will be expected of you—and what you can expect—during your time here. Meeting this challenge should provide you with a good foundation for a career in biomedical research science.

COMMUNICATION, COMMUNICATION, COMMUNICATION –Seminars, Talks, Abstracts, Manuscripts, and Participation in Lab Meetings

Communication of experimental results in the form of abstracts and talks, and via manuscript preparation, is the most important way to improve your opportunities for career advancement. Through your ability to acquire, develop and communicate experimental results, your worth as a scientist will be evaluated by the scientific community. Senior LMGR PIs (e.g., Drs. Howard, DePamphilis, Ozato and Clark) as well as Staff Scientists and Fellows will also learn about your work at the Monday

Morning Seminar Series. They may be asked to evaluate you; or you may want them to write you a letter of recommendation. Therefore, it is invaluable to make a good impression through hard work, group participation and good communication skills.

Future employers will look for a good researcher who not only has a strong publication record, but one who can also contribute to their department or company as an advisor—through stimulating discussions and collaborations; ideally they want someone who is easy to communicate with. Therefore, along with good presentation skills, you should work to develop the highly valued ability to offer *constructive* criticism in group meetings. Although this does not mean that you should feel pressure to make comments in group meetings, quality remarks can help the speaker and make a good impression. You will have this opportunity at the Monday Morning Seminars, Tuesday SMCB Lab meetings and seminars by speakers from other Institutions that are invited to the LMGR.

SMCB LAB MEETINGS: You will be expected to discuss your work in lab meetings, which occur on Tuesdays at 3:30 PM. You should prepare presentations with introduction and background information and include your raw data. You will be expected to present your data approximately once every three months. We may also engage in a group discussion of your data and your project in lab meetings without a formal presentation. On some occasions Lab meetings are a good venue for detailed review of a publication from another lab (i.e. journal article review).

PRESENTING AT NIH INTEREST GROUPS: The SMCB has the opportunity to present a talk, usually once per year, at both the NIH RNA Club and the Washington Area Yeast Club (4:30 PM, second Wednesday of the month in bld 6A, conference room 4A05), and occasionally at Lambda Lunch. I will invite a fellow with a reasonably advanced story to present on behalf of the SMCB. If you would like to make a presentation in these forums, please ask me.

ATTENDING OUTSIDE MEETINGS is important, not only to hear recent developments before their publication, but also to allow others to get to know you and your work. I am happy to use SMCB funds to support travel for fellows who have submitted an abstract to FARE (see below, win or lose; however, FARE recipients get additional free travel money), on condition that you submit an abstract for talk or poster presentation at the meeting. This usually involves submitting an Abstract describing the work to be presented to the meeting coordinators at the time of registration.

SUBMISSION OF ABSTRACTS TO NIH FUNCTIONS: You should expect to submit abstracts both to the annual Fellows Awards for Research Excellence (FARE) and to the NIH Research Festival programs. The FARE program provides Travel Awards valued at about \$1,000 annually to NIH fellows on a competitive basis. About 25 percent of the abstract submitters receive an award. Receiving a FARE award is a significant achievement that will increase your recognition in the LMGR, the NIH, and beyond. If you win, this should be listed on your C.V. as a competitive award.

NETWORKING: We know from experience that although a good publication record is important, it alone may not be enough to launch or establish your career. In addition to

the opportunities listed below, I will make colleagues aware of your work and when possible, introduce you to them, and promote your exposure to the community. I do this by naming you when you help with manuscript reviews for journals, in communications with other scientists, when I talk at meetings and seminars, and by recommending you for talks at meetings. Also, you will have the opportunity to talk with established researchers when they are invited guests of the SMCB and on occasion other NIH Labs. Please inform me if you would like to meet with a visiting scientist.

JOB SEMINAR: Developing a good presentation or "job seminar" is a very important feature of a job interview. The program provides many opportunities for you to see how others present and to learn from good presentation styles as well as the bad. Others will also have the opportunity to critique your presentations.

DATA PRESENTATION -THE VALUE OF MULTIPLE FORMATS AND VENUES

Learning to increase the rate at which your data can be interpreted, so as to produce useful information, is one of the most challenging objectives for all scientists. The experienced experimentalist chooses incisive experiments with as many controls as possible as the surest way to achieve this. Frequent discussion of your raw data with me is probably the best way to keep your project moving on the right track. We will discuss and plan how to proceed efficiently, develop testable hypotheses and explore interesting findings. I would like you to inform me of your results at least once every two weeks, preferably more frequently.

I have found that the means by which I acquire and process information is influenced and enhanced by the setting; for example, sometimes I articulate things differently in a casual one-on-one setting rather than in a group discussion; and other times, vice versa. Also, we may interpret a piece of data in a one-on-one discussion differently and/or more extensively than we would if it's presented in a group meeting, perhaps because during the latter more formal introduction and background are provided and the rationale for the experiments are placed in the context of the scientific literature. Moreover, sometimes it just takes time and repetition before all of the implications of some data "come" to me. Therefore, I feel that data, hypotheses and models, etc. are best presented and discussed in a wide variety of formats, one-on-one talks in my office, lab meetings, corridor discussions, etc. Please seek me out to tell me about your progress at least once per week. This should help us extract as much information as possible from the data and provide ample opportunities to make connections to other data and different systems.

Your presentations at Data and Journal Clubs, as well as Seminars, should be well prepared. You should take these very seriously. Rehearse your presentations for Monday Morning Seminars, talks at meetings, RNA Club meetings, and any other talk where you will represent the SMCB in public. Electronic imaging facilities are available in the LMGR and are constantly improving in quality and usability. If you don't know already, please learn how to use graphic aids to effectively increase the friendliness and information content of your presentation. Models, statements of hypotheses and graphic depictions of experiments go a long way to improve the communicability of presentations. These types of slides often stimulate the most useful discussion.

CONDUCT OF RESEARCH

You should function at the NIH with the highest degree of scientific integrity. Workshops and formal discussions of ethics related to scientific issues occur in a group meeting format annually in the LMGR; your attendance is mandatory. Honesty, criticism and responsibility are expected of you and your coworkers, and you should know what to do if something goes wrong. You may find such information in "Guidelines for the Conduct of Research in the Intramural Program at NIH" (<http://www.nih.gov/campus/irnews/guidelines.htm>) that discusses such things as: Responsibilities of Research Supervisors and Trainees, Data Management, Publication Practices, Authorship, Peer Review and Privileged Information, Collaborations and Financial Conflicts of Interest. This is a general but useful source of information and is required reading. In general, if something goes wrong, go to your supervisor (me) first, or another LMGR PI, or the LMGR Lab Chief, Bruce Howard.

AUTHORSHIP & COLLABORATIONS

Because of the way that projects develop in this Section there is usually not conflict over authorship, but on (rare) occasion disputes among fellows over first authorship have arisen. We want to avoid this by discussing it openly ahead of time. In case of a dispute, I will be the major determinant of the order of authors. Some conflicts arise when a fellow comes into a project that is already ongoing and for which other or previous fellows have already done considerable work. Often the later arriving fellows have little appreciation or knowledge of the contribution of the departing or departed fellow and naively believes that the project is His or Hers and should be in full control. It is important that we discuss any anticipated order for authorship not only at the beginning of a collaboration but also as it continues as it can change depending on the development of the project and the work done or to be done. In general, fellows who add to an ongoing project that has already undergone substantial development, i.e., for which much data has already been obtained, will not be first author. However, exceptions may apply as each story and the way it develops is unique. For example, in some cases much data may have been obtained by multiple people who each contributed a small part, but with none with a leading role. I can see how in this case a newcomer could make significant additions and become first author. What is most important is not to assume anything about the situation and to discuss it with me.

As alluded to above, another recurring issue is "ownership." Even when people understand that NIH "owns" the data and the biological materials, they often think that the project they are working on is "theirs" and interpret that to mean that they have extensive rights with respect to the project including the right to decide with whom they can collaborate and even the right to decide the future scientific direction of a project, even to the point of believing they can override the PI's preferences.

Criteria used for determining first authorship are not altered because someone is looking for a job. One is no more entitled to first authorship when they are on the job market than the circumstances normally dictate based on their work relative to others.

As a member of the SMCB you should expect to coauthor another SMCB member's primary paper only if you have made significant contributions. Although collaborations among SMCB members are encouraged and common, these should be entered into and agreed upon explicitly by the individuals involved as well as me. Usually, coauthorship

requires you to generate data that is included as a Figure in a published paper; simply providing advice/suggestions or a reagent is not enough, unless the reagent is either created specifically for the collaboration or has not been published previously. I may make exceptions depending on the case. I may ask you to teach someone an assay or technique, but this does not mean you should necessarily expect to be a coauthor. These important issues should be discussed to avoid potential misunderstandings. Likewise, you may benefit from the help of a colleague who knows an assay that you need to learn.

Before you enter into collaboration with a non-SMCB member, speak with me first and certainly refer the potential collaborator to me. Although it is not required that you speak with me before you make a request of materials from others, I prefer that you send me a draft of the request before you send it to the outside researcher. Requests by others for SMCB reagents must be discussed with me before they are distributed.

TECHNICAL SUPPORT IN THE SMCB

The SMCB has access to technical support in the form of ready-to-use buffers, media, pre-poured plates and gels, oligo DNAs, radioactive labeling services and other services. I would like to emphasize that the value of these is to provide you with more time to plan and execute experiments and to record and prepare your results for presentation. Sergei Gaidamokov is a very experienced biochemist and molecular biologist who takes direction from me and/or from a SMCB colleague with whom we have worked out a collaboration plan. In general, he has his own projects that he works on, in collaboration with me and/or another SMCB member.

CAREER DEVELOPMENT

Collaborating and networking are important for career development. So is your experience as a Fellow. You should expect to learn how to design and execute experiments, choose good problems to work on, choose good model systems to work on and make connections between different fields during your time in SMCB.

Evaluation

I evaluate all fellows regularly. Continuation of your fellowship into the second year and beyond is expected but not guaranteed, you must be an active positive contributor to our work. Extensions are approved on a yearly basis. A small number of fellows may continue their postdoctoral training beyond three years, and up to five years (or more) but only upon approval by extra-LMGR personnel and following an evaluation and review of your work. Fellows are expected to function with increasing independence over time, and to assume additional responsibility for our work. Increased independence should never be confused with a lack of accountability. We must all be accountable, always.

You should be aware that I am often asked to evaluate people before and after they leave our group, specifically by potential employers and fund granting agencies. It is not uncommon to be asked to rank a candidate in several categories. A typical "Reference Report Form" includes:

- Knowledge in the chosen field
- Motivation and perseverance toward goals
- Ability to work independently

- Ability to work as a member of a research team
- Ability to plan and conduct research
- Ability in oral expression
- Ability in written expression
- Imagination and probable creativity
- Communication skills.

They also ask for ranking, i.e., top 2%, top 5%, top 10%, top 25% of fellows, etc. It is helpful to keep these items, and your responsibilities, in mind during your training, and always to conduct yourself as professionally as possible.

WORK HABITS; THE QUANTITY AND QUALITY OF LAB TIME

In addition to providing training, the SMCB is responsible for maintaining a competitive research program whose progress is monitored regularly and funded according to its productivity. Everyone's efforts are of paramount importance to our success. The SMCB has been provided with funding and ancillary services to maximize the time available to fellows to conduct meaningful experiments. You should place high priority on optimizing your use of the resources to enhance your ability to generate results. The extent to which you achieve this will likely be *the most* important determinant of your success.

You should spend the majority of your time designing and executing experiments. A good strategy is to maintain two to three subprojects at all times so that during the idle periods of one, you can focus on the other. You will always need to make some reagent or to prepare for the next experiment.

You are expected to spend your time in the lab designing, preparing for or performing experiments, and discussing data in a professional manner. If you aren't busy, you may be distracting others in the lab. If you are away from the lab I will notice. I prefer that your schedule overlap with mine as much as possible, because this increases opportunities for us to communicate (I usually arrive by 8:30 AM and depart after 6:00 PM). I am sometimes available on the weekend, -just ask if you want to meet with me or need my help then. I often get much work accomplished on weekends and I will be glad to see you do the same. Your "work ethic" is one of the important questions potential employers will ask me as your supervisor. Use your time well, work efficiently, put in long and productive hours in the lab: strong efforts on your part will be noted most positively.

NOTEBOOK—RECORD KEEPING more than a legal requirement at the NIH

Devote a lot of time and attention to maintaining your laboratory notebook. Your notebooks will remain at the NIH even after you leave. They will be part of the official record of our work in SMCB. I expect the following:

- A daily record containing the month, day and year
- detailed information about your experiments
- pages must be numbered
- Your notes should be neatly written, clear, concise and rich with information (concentrated into one or two pages per experiment), in English.

Each experiment should have easily identifiable sections:

- Title or Objective
- Methods (e.g., flow chart or schematic, reaction components, etc.)
- Results (gel photo or statement of autorad result)
- Conclusions
- Suggestions for the next experiment (if applicable)

Ancillary material and notes (e.g., computer printouts, sequences, material inserts, technical information, order forms, etc.) may be kept as a separate record so as not to interrupt the flow of the daily experiments or clutter the primary notebook.

Keep one notebook for each project. I find that this improves readability and flow, and decreases confusion.

- Cross-reference to other projects as necessary
- Detailed information is an important part of the record and must be included as well as the raw data obtained
- Negative data must be documented and included.
- Daily research activities should be recorded as complete accounts of the experiments performed, e.g., reagents described with regard to the supplier and/or date generated if made by yourself or another SMCB member.
- I also ask that you summarize your results, in your notebook, in the form of a short paragraph or two, once per month.

For an example you are welcome to look at my notebook. I expect to look through your notebook, and I may on occasion ask you to submit it to me, so that I may examine it carefully. I should be able to find your experimental results on a particular project, read and follow your notes without difficulty. I truly believe that these are good practices that will benefit your research.

SCIENTIFIC ADMINISTRATION & LEADERSHIP

All fellows should develop experience with certain administrative aspects of science. For example, you should expect to help review manuscripts, both those generated in the SMCB and those from outside journal editors who ask me to review submitted papers. If your contribution is significant you will receive credit: either I will name you as a co-reviewer to the Editor or mention you in the Acknowledgements section of a SMCB manuscript. As with the section above about critiquing your colleagues' presentations, being able to point out weaknesses while identifying areas that can be strengthened, improved or expanded, are valuable skills for assessing written work.

GRANTSMANSHIP: The NIH/NICHD sponsor regular workshops designed to help postdocs apply for outside funding and develop their grant-writing ability. Career transition awards, supporting young investigators' transition to independent positions in academe, include NICHD's K22 award for intramural fellows and the K99/R00 grant established in the spring of 2006. You should let me know if you would like to apply for outside grant support, and I strongly recommend that you use available resources to develop your skills. You will need to include significant preliminary data in a grant

proposal and therefore should not expect to begin to write a proposal until you have been here for more than one year.

MENTORING: The ability to support the growth and development of less experienced scientists than you is an important feature of research life. Summer students at various levels of training have been a part of the SMCB throughout the years, as have yearly pre-IRTA (Postbaccalaureate) students. When feasible and when you are ready to accept responsibility to be a mentor, I hope to be able to accommodate you. This depends on space and resources.

OTHER SKILLS: The NIH Fellows Committee and the Pre-IRTA Committees both operate list-servs on the NIH global e-mail network. These groups offer programs in support of your professional growth, as does the NICHD Office of Education. You may also want to subscribe to the List-SERVS for the NIH RNA Club, Lambda Lunch, and Washington Area Yeast Club to be made aware of their seminar schedules.

Sincerely,

Rich Maraia