CRAMER GROUP GUIDELINES

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Purpose: Research can be a high-stress occupation, contributing to tension amongst and/or friction between the members of a research group. It has been my experience that lack of communication often exacerbates this potential problem. So that there are no doubts, I would like to spell out my philosophy on a number of issues affecting the group. This list is hardly all-encompassing, and will need to be amended periodically, but it should be viewed as a general framework within which to conduct ourselves accordingly.

1. Roles of Individuals:

a) *Faculty (me):* I am neither infallible nor am I possessed of any particularly deep insights into personnel management, although after 20 years, I've hopefully picked up a few skills. I would like to treat all members of the group with respect and fairness. If you have any complaints, you should see me *immediately* so that we can discuss it. My own job in the group is to provide overall guidance, to ensure the availability of adequate facilities to accomplish outstanding research, to assist graduate students (and undergraduates) in completing all of the tasks necessary to obtain their degrees, and to assist each of you as much as I can in finding a follow-on position that excites you. There are shockingly many demands on a faculty member's time, but you should never hesitate to see me if there is something you want to discuss, science or otherwise. If I really can't spare the time at that particular moment, I may ask to schedule something in the near future, but it is never an imposition to speak with me—that's my job and I actually really love my job.

b) *Postdoctoral associates:* By earning a Ph.D. degree, a postdoc has demonstrated the ability to think creatively and independently. I intend not merely to encourage such behavior, but to rely on it. Postdocs should feel free to explore new ideas with regard to their research and propose future directions. I expect you to contribute significantly to the preparation of papers, probably to include preparing first drafts. I further expect you to serve as leaders within the group and will assign you various responsibilities as they arise. Finally, your experience and expertise is a resource for the graduate students—don't keep it under wraps.

c) *Graduate Students:* You span a terrific range of ability and experience and it is thus difficult to define a specific role. In the first two years, much of your time will be engaged in coursework and becoming familiar with the techniques required for your research. You should become familiar with the literature pertaining to your project, and with the wider literature in general. By your second spring (at the latest), you should begin making significant progress on your projects. You should demand (and I will try to afford you) all of the freedom that you can handle in terms of defining your own research. In your third year,

we should attempt to define all of the science that you need to accomplish in order to complete your degree. As you spend the rest of your time reaching that goal, you will be assigned many of the responsibilities listed above for postdocs. While the ultimate goal of graduate school is to reach the stage at which you can *plan* and *conduct* research independently, every student has his or her own preference with respect to the frequency of oversight that he or she would like me to exercise. If you are feeling over- or undersupervised, please just tell me. I'm happy to adjust. In general, because of my own limited time, I expect the more frequent complaint to be *under*supervision. To address such concerns, it is often helpful to adopt a definite schedule of individual meetings; so, again, let me know if at some point you would find such an arrangement beneficial.

d) *Undergrads:* Soak up everything you can—provide enthusiasm in return! Treat your project as a learning experience; useful results are icing on the cake. From a more practical standpoint, I am almost certain to ask you to work closely with one or more of the more senior members of the group. This does not reflect any lack of interest on my part in your project; it is rather an attempt to ensure that you will always have ready access to qualified, expert advice without necessarily having to hunt me down. It is also very important that graduate students and postdocs have the opportunity to develop their *own* mentoring skills.

2. Time in the Lab: The *last* thing I want to foster is an atmosphere where people feel they are punching some sort of time clock. I am usually here weekdays from 9:00 AM to 5:30 PM, and an occasional weekend or holiday. I am almost constantly logged in between 6:30 AM and midnight. If you are spending an equivalent amount of time on your research, great! However, this is not a minimum standard. I expect postdocs to know what constitutes adequate effort, and I will let you know if we disagree. As for graduate students, it is essentially true that it takes a certain number of hours to complete a Ph.D. (with some variability due mostly to luck) and you can get there quickly or slowly depending on your own commitment. Again, common sense should serve to define reasonable minimum standards for RAs. Finally, I care more about your results than I do about seeing you whenever I stop by. If you have special needs because of children, visitors, etc. just let me know so that I have some idea when I *can* find you.

3. Vacation: Everybody needs an occasional period away from work during which to refresh themselves. Postdocs should feel free to take up to two weeks paid vacation per year. Graduate students are in a slightly different situation since they are progressing towards a specific goal -- don't burn yourself out, but recognize that more time spent working means less time before leaving. Naturally, I expect to be informed of any extended absences.

4. Progress Reports: Once upon a time, I asked for monthly project reports. These took the form of a manuscript in progress. While this sounds like a lot of work, it proved extremely efficient when it came time to actually prepare papers,

etc. At a minimum, calculated structures were illustrated, and energies provided (perhaps tabulated) for all accomplished work. Important recent literature was noted, and a general background was maintained. Reports were works in progress and not expected to be polished; however, they provided a complete representation of all work up to that point. I halted the practice for various reasons, but individuals really *should* consider maintaining their research results in this form, at least to the extent of organizing data in a meaningful fashion (structural pictures, tabulated data, etc.) When discussing raw data, it is sometimes quite hard for me to understand a stream-of-consciousness spreadsheet. While I am likely ultimately to want to see that spreadsheet when writing a paper, *processed* data are far more useful in discussing research results.

5. Group Meetings: We have weekly group meetings.

Purposes:

1) Although senior group members no longer take formal classes, that certainly does *not* imply that they (or I) have nothing left to learn. One purpose of group meeting is to learn new things based on the work of other group members studying areas of chemistry or using techniques different from those with which you are familiar. When you leave, you should not just be an expert about what you did yourself, but also, hopefully, you will have authoritative knowledge about many other areas because of your exposure to them through, in part, group meetings.

2) Once upon a time, I was in the lab every day. Later, I dropped by two or three times a week. Now, I essentially never visit without a specific reason. In addition to my own scientific activities, I am presently burdened by rather heavy editorial, service, and faculty governance commitments. My guess is that this situation is unlikely to change anytime soon. So, in order to stay on top of everyone else's research efforts, I *rely* on group meetings.

3) The chemical literature is a vast ocean of information that has become almost impossible to navigate in a solo fashion, although useful search tools are certainly out there. By coordinating efforts, some efficiency can be gained. In particular, individuals can alert each other to potential articles of interest without each person having to search every journal every issue.

4) **Presentation skills are absolutely critical for landing a job**, whether in academia or industry. They *remain* absolutely critical for *advancing* in that job. By presenting at group meeting, group members become more proficient with organizing and presenting data, with speaking in front of audiences, etc.

Structure:

I always welcome feedback on how best to structure group meeting. Here are some options:

1) *Literature survey group meetings*. We now do these once per month. If you identify an article for presentation, at an absolute minimum you should present:

a) The title
b) The authors
c) The complete citation
d) An *informative* summary. A copy of the abstract is certainly fine, but it is helpful to have a more in-depth appreciation of what the article is about. This does imply that one should *read* the article—perhaps not in enormous detail, but at least the introduction and conclusions in order to appreciate the importance. Think about what the most obvious question I (or anyone else) might ask, and be ready with the answer.

Let me amplify on this a bit. To be successful as more than simply a technician, one has to stretch one's horizons on a frequent basis. The literature can be a vast wasteland from a certain perspective, but it contains within it everything that's exciting, too. Finding new ideas and new research directions nearly always begins with the literature. You should try to find time every week to look at an article or two not just because you have to survey certain journals for group meeting, but because it will make you smarter, faster, and stronger!

2) *Research progress*. For non-literature group meetings, one option is to have everyone speak about what they accomplished in the last week. I would like to emphasize, as strongly as possible, that the intent is not to create a high-pressure environment that competes one individual's progress against another's, or against some arbitrary standard. Instead, it lets *me* stay on top of what you are doing, offer suggestions to keep things moving along efficiently, etc. A group meeting presentation is *not* meant to be a full scale seminar with complete stories wrapped up in a bow. If not much happened in the last week because of TA duties, or computer downtime, or time spent reading the literature, that's fine—talk about whatever results there are. This doesn't just keep *me* up to date, it's also useful for other group members to see things developing and the progress comes in bite-size chunks. Now, it may be unwieldy, when the group is large, to do every single person every week, but we can look for a happy medium.

Incidentally, while on the subject, sometimes when I discuss research with someone, I make a suggestion. I am afraid that it becomes *your* responsibility at that point to remember that

suggestion moving forward. I make dozens of suggestions a day, some brilliant, some stupid, but as a result I am not terribly good at remembering all of them three weeks later. Perils of age. Please write down what we talk about if you, too, are prone to forgetfulness.

3) *Practice talks*. Sometimes someone is off to present to a company, to a conference, preparing for an oral, etc. In the past we have used group meetings as practice sessions. On the whole, I would prefer to avoid this unless we know ahead of time that there will be little else to discuss at a given group meeting. Since my highest priority is to keep up with everyone's research projects, I'd rather schedule *additional* meeting times for practice talks than diminish the time spent discussing research progress.

4) *In-depth presentations*. Occasionally, when a more senior individual joins the group, it is useful to hear a full-scale seminar about his or her prior work. In addition, sometimes a paper or topic comes up that may warrant a similar hour or hour-plus treatment. A long time ago, I structured group meeting so that two people would speak: a senior member would give a very complete research update and a junior member would give a very detailed presentation of a paper selected by him or her, or by me. We could re-adopt that model, which has two strong advantages, namely, that we all hear about outside work regularly, and that younger group members get practice reading and summarizing papers. On the other hand, it has the disadvantage that individuals' research progress is presented only once every several weeks if the group is larger.

5) *Tutorials*. Some group members are using different models and codes than others. Maintaining group memory is a valuable goal, so periodic "training" sessions on particularly useful topics can be useful, particularly if the presentation is in some archivable form. Indeed, we should likely try to create a group website, archive, etc., that stores such items. Perhaps someone should take that on as a group task…

In general, the senior postdoc or graduate student will handle the routine scheduling of group meetings. There may also be sub-group meetings, as many people are involved in collaborative projects. There is a subtle difference between good management and too many damned meetings. Let's try to err on the favorable side of that difference.

6. Seminars: Let me be blunt: **go to as many as possible**. You will never again have the chance (unless you become a staff member at a Research I school) to hear so much cutting-edge science. Take advantage of your opportunity to soak up the knowledge of the many presenters that come through the Department. Will some of those seminars be awful, boring, useless wastes of time? Of course! I hate those, too, but, even they offer a learning experience—ask yourself what the presenter did wrong and resolve never to give a talk like that yourself! On the other hand, there will also be many seminars that will teach you new things, and, if you're lucky, one or two that will give you great new ideas in any given year.

Sitting in the lab instead of expanding your knowledge base may get you an hour closer to graduation (if you're a student) but it won't make you better prepared for the job interview that covers an aspect of that seminar that you missed. Go! And, if you don't see *me* there, rest assured that you will have just demonstrated your superior commitment to achieving the level of renaissance scientist.

7. Community: Graduate school, college, postdoc-ing—all of these things are a challenge from which it's good to get some release from time to time. We all, obviously, have our own individual lives, and have hopefully structured them to include such release. But, it is also important to have occasional group activities that are purely social in nature. Over the years, as I've grown busier, I've become less proactive about initiating such activities myself. But, I have rather good memories of various group parties, canoe trips, disc golf outings, barbecues, softball games, bowling outings, and so on. From time to time, we've had a group social-activities coordinator (although at the moment that position appears empty). Irrespective of being "assigned" that role, please be open-minded about suggesting activities.