

## **Increasing Retention and Improving the Climate for Women in Chemistry**

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### **Abstract**

Since 1989, the University of Minnesota Department of Chemistry has sponsored workshops designed to increase retention of women in this department. Since 1995, the Chemistry Department WISE Team, composed of faculty, staff and students, has taken over this program. Most of the activities target graduate students at various stages. Two workshops on job hunting focused on resources for finding positions, resume and Curriculum Vitae writing, and interviewing, and delineated differences in academic versus industrial job searches. Non-traditional careers in Chemistry at either the M.S. or Ph.D. level were the focus of a panel discussion. Workshops on dealing with motivational slumps and goal development and assessment were held to assist students in setting long- and short-term goals and maintaining perspective in graduate school. The particular challenges of first- and second-year graduate students were addressed in workshops on Choosing an Advisor, study skills, dealing with procrastination, and preparing for oral prelim exams. We have established a lunch seminar series for women in which graduate students present their research to undergraduates, as well as a special departmental seminar featuring a prominent woman chemist. Workshops and other events have been well-attended and well-received by participants. The Chemistry WISE Team events have been funded by grants received from the Office for University Women and the Department of Chemistry, at \$1000-\$2000 per year.

### **Introduction**

Women pursuing graduate degrees leave their programs for many reasons, ranging from change in career goals to a hostile climate in their program to the inability to cope with the stress of graduate school or a feeling of lack of preparedness. Our program seeks to address these issues by helping graduate students honestly assess their goals, improve the departmental climate, and provide students with tools to effectively manage the various stresses of their graduate careers. From the Chemistry WISE Team's experiences, we determined that the most difficult time of graduate school might be the

first two years. However, there are different issues that might be felt just as strongly in the middle and latter part of a student's graduate school experience.

The Chemistry Ph.D. program is very structured in the first two years (the vast majority of students are admitted as Ph.D. students, and the first year is typically the same for M.S. and Ph.D. students). The first year is spent completing coursework and teaching assistant expectations. The second year is consumed with the written and oral preliminary exams for candidacy. The latter three years are far less structured, and so can cause students as much anxiety, due to the lack of concrete goals and assessments of their progress. Finally, towards the end of the program, the students must begin searching for jobs, and need the requisite skills for this process.

## **Programs**

### First Year

All first-year students attend a two-week departmental orientation before classes begin, during which procedures are outlined, and teaching assistant training is conducted. The WISE group plans a Peer Advising Picnic for the first week of orientation, at which new students can informally interact with current students. There are materials available for the new students about the department, graduate school, the Twin Cities (restaurant and entertainment guides, as well as "tips"), and campus resources, including the graduate student governance body, and women in science groups. A list of "senior" graduate students willing to serve as Peer Advisors for the year is also distributed (with contact information for them including research area and advisor). This event is open to all new graduate students and is funded by the department. Pizza or other dinner is served, along with beer.

The Study Skills and Time Management Workshop was conducted by a representative of University Counseling and Consulting Services. The topics that were covered included note-taking, reading technical material effectively, and preparing for exams at the graduate level. Members of the WISE team felt that often graduate students are used to being at the top of their classes, and might have trouble admitting that they are having difficulty with more demanding graduate-level courses. Additionally, women are more likely to feel that they are "imposters" in graduate school (that it's only a matter of time before officials find out how dumb they really are), so having this workshop for the first-year students can help dispel those feelings of worthlessness and isolation.

Since students in our program rarely utilize their advising committees, choosing an advisor is a crucial decision for them. We held a separate workshop to address this issue. The WISE Team assembled a list of questions for students to ask themselves, the prospective advisor and the prospective advisor's research group, to help the students think about what is most important to them. More senior graduate students gave a short introduction to the workshop and the decision, based on Marie desJardin's "How to Be a Good Graduate Student" (<http://www.cs.indiana.edu/HTMLit/how.2b/how.2b.html>). We

also arranged tables by specialty area, so first-year students could talk to more senior students in their area and in research groups that they were interested in joining.

### Second Year

Much of the second year of the Ph.D. program is spent achieving Ph.D. candidacy, which means passing the written and oral preliminary examinations. The Department of Chemistry provides all students with the department's General Information Bulletin, which contains detailed information about progress through the degree, including specifics on the format of the written and oral preliminary exams. Most students progress through the written exam with little distress (though little sleep, as well). The oral prelim exam, on the other hand, is met with anxiety. Most areas require an independent research proposal as a part of the oral exam, and the guidelines for what constitutes a sufficient proposal are less clear and differ by research specialty area. Students also fear exposure as less than Ph.D. material, and this is a particular problem for women. We have held oral prelim "help sessions" for second year students, in which more senior students discuss their experiences over dinner. We prepared a handout of tips for getting through the exam, covering such topics as: how to choose and research your proposal topic, how to present yourself in the exam, how to handle tough questions, and dealing with stress and procrastination. The second year students are also given a list of students who are willing to listen to practice presentations, with advisor listed, so the second year students can choose students whose advisors are on their exam committees. This list is given to all second year students, not just those who attend the help session.

### Middle Years: Staying on Track and Looking Toward the Future

Two very popular workshops that were targeted to the middle years of graduate school were "Keep Moving: Motivational Strategies" and "Goal Assessment and Development." The Motivational Strategies workshop featured speakers from the university community, University Counseling and Consulting Services, the Institute of Technology's Dean's office, and a graduate student in another science department. One focus was on helping graduate students identify the sources of motivational slumps. The speakers addressed how they were able to stay motivated through particularly difficult times, and how they establish a reward system for themselves. A panel of graduate students, post-docs and new faculty also discussed their strategies for staying motivated, setting short- and long-term goals, and balancing the many new demands on their time that graduate students face.

The participants in the Goal Assessment and Development workshop took the Myers-Briggs Personality Type Indicator short version and self-scored their tests before the workshop. A licensed Myers-Briggs administrator discussed the results in general terms to give the participants insight into their type. She also discussed the "constructive use of differences," how to effectively work with people of different types, and use those differences to everyone's advantage. Two former members of the Coalition of Women Graduate Students discussed the use of the self-assessment guide "Thriving Through the

Experience” (now available on the web at <http://www.umn.edu/mnwomen/>; permission has been granted by the Coalition of Women Graduate Students to freely distribute any or all of the guide). “Thrive” is a detailed self-assessment that prompts graduate and professional students to think about why they are pursuing their degrees and what it means to be joining the community of scholars in their fields. Small groups of students discussed different sections of the guide and then reported to the entire group. The workshop was concluded with a panel discussion that included women who had taken circuitous routes to their present professional positions, either because they had children, or had very different careers and interests. They addressed how they maintained their goals even though they weren’t actively pursuing them, or how they developed new goals when they realized their careers weren’t personally satisfying.

### Beyond Graduate School

The WISE Team has planned a few career workshops. Workshops on non-traditional careers in chemistry have featured such diverse professions as technical writing, patent law, forensic science, food science, and brewing. A workshop on academic careers this summer will include faculty, mostly women, from different types of institutions and at different stages in their careers. Our confirmed speakers represent small liberal arts colleges, comprehensive universities, a community college, and the University of Minnesota.

Other workshops have focused on the more practical aspects of careers. Post-docs and new departmental hires have presented strategies for finding post-doc positions and funding for them. The Chemistry Department has its own industrial recruiting process, and keeps sample resumes on file. The staff person responsible for that program presented the logistics of it and other resources available to Chemistry graduate students. A new faculty member in the department discussed the academic interviewing and hiring process and a few advanced graduate students in the throes of the job search presented their experiences and lessons learned. We have also invited career services representatives to give advice on cover letters, resumes and CVs, and the logistics and concerns of putting a CV or resume on the World Wide Web. Particularly useful was a panel of industrial recruiters (who recruit in our department) and members of academic hiring committees who presented their experiences and answered student questions about the interviewing process.

### Other Programs

*WISE seminar speaker* The Chemistry WISE Team sponsors a special seminar by a prominent woman chemist once per year. The invited speaker has most meals with students, and there is time in the schedule for women students and post-docs to meet with her. This allows for informal interaction with the speaker as well as among women in the department, and is a good opportunity for networking.

*Celebrating Women Chemists* This monthly lunch seminar series is an opportunity for female graduate students to give short presentations about their research.

The presentations are targeted to a non-specialist audience, and undergraduates are encouraged to attend. Since the presentations usually last 20-30 minutes, there is also time for discussion of pertinent issues. Lunch is provided to all those who participate.

*Post-Docs* The WISE Team has recently turned its attention to post-docs in Chemistry. Post-docs are often forgotten on our campus, and on many campuses, since they lack their own governance system, and there are few organizations serving them or protecting their interests. The Department of Chemistry has about 40 post-docs at any given time, compared to just over 200 graduate students. Our first project is to assemble a packet of resource materials for post-docs. This includes information on the University, the Department, and the Twin Cities. We plan to expand this outreach to include social events at which we can further assess the needs of post-docs in Chemistry.

### **Logistics**

The Chemistry WISE Team is composed of about five graduate students, two academic staff persons, and a faculty member. The funding for events is from grants that the group writes once per year. The Chemistry Department matches the Team's grant income dollar-for-dollar. To date, we have received grant funding solely from the Office for University Women (formerly the Commission on Women) at Minnesota, which administers a small annual grant program for on-campus programs aimed at improving the campus climate for women. A typical annual budget is about \$1500-\$2000. In one year, the WISE Team usually holds 2-3 workshops, plus the special seminar speaker and other small events, such as the oral prelim exam help session. The students of the WISE Team work as volunteers; the department donates in-kind staff time to work on WISE projects. Men are invited to all WISE workshops, since not only will the information and networking opportunities benefit male students, but the climate of the department improves when the male students better understand the particular issues of their female colleagues. Most of the workshop presenters are women, but men are not excluded. Male students, and any faculty, are not invited to the Celebrating Women Chemists lunches.

### **Conclusions**

The WISE Team's programs provide graduate students with mentoring opportunities in a number of ways. They facilitate informal interactions with other students and faculty. Getting to know senior graduate students and faculty in a non-research setting makes them more accessible, and makes it easier for graduate students to approach them for advice on careers, research, or specific problems. The workshops often involve graduate students, post-docs, staff and faculty from other university departments. Chemistry graduate students expand their network and are exposed to different realities and perspectives. Nearly all of the workshops also increase the students' awareness of services available to them on campus, such as Counseling and Consulting, Career

Services, the Women's Center, Health Service, and Teaching and Learning Services. We hope that these events educate and empower students to use the resources, both official and personal, available to them to fully assess and then meet their goals.

### **Other Resources at Minnesota**

The *WISE student group* is a university-wide group of undergraduates, graduate and professional students, and post-docs in all scientific fields. A relatively new group, they have sponsored three events this academic year, plus a social at the university's natural history museum. The "Survival Skills for a Successful Scientific Career" featured Beth Fischer from the Survival Skills and Ethics Program at the University of Pittsburgh, and Catherine Jay Didion from the Association of Women in Science. Local speakers addressed other topics, including resumes, CVs, portfolios, and applying and interviewing for jobs and graduate and professional programs. One workshop was about the career and educational opportunities available to science students with bachelor's degrees. The third event was a workshop featuring a speaker on time-management and prioritizing, and a panel of women scientists who spoke about balancing their careers and families. This group is entirely volunteer, except for a faculty advisor, and all events are funded by grants from various university student-development programs and offices such as the Office for Multicultural Affairs and the Graduate School.

*IT Program for Women* is a program for women in the Institute of Technology, which includes engineering and the physical sciences, administered through the IT Dean's office. This office coordinates outreach activities designed to encourage girls to pursue science, and involves graduate and undergraduate science students in these programs. The office sponsors a monthly pizza lunch for female graduate students with featured speakers on such varied topics as pursuing an academic career, balancing work and personal lives, summer reading lists, personal safety, communicating with an advisor, and research on the experiences of women and girls in education. The Graduate School as an Option program (now a WISE program) sends small groups of women graduate students in science to local colleges to discuss their experiences in graduate school, and to tell women (and usually some men) what it is like to be a graduate student.

*Council of Graduate Students and Graduate and Professional Student Assembly* are the graduate and professional student governance organizations. They are currently developing plans to aid students in their professional development and are planning to focus on the role of faculty in this pursuit.

*University of Minnesota Alumni Association* The UMAA administers a formal, matched, one-on-one, year-long mentoring program targeted mainly to undergraduate students, which is run through each college. The Graduate School does not currently maintain an alumni network, so graduate students seeking this kind of mentoring experience can enroll in the UMAA program through the college to which their department belongs.