THE UPPER RANKS

Making the Grade As a Scientific Manager

Scientific training doesn't include courses in running million-dollar labs. Here are some tips.

Ask Ellen S. Vitetta about the high point of her career, and she'll tell you it was 26 April of this year. That's when the immunologist, who works at the University of Texas Southwestern Medical Center in Dallas, learned that she was elected to the National Academy of Sciences. But it was also the day that 55 of her former students and postdoctoral researchers gathered, at a Texas-style barbecue at the annual meeting of the American Association of Immunology in Anaheim, California, to celebrate the 20th anniversary of her lab.

If being a good mentor is a criterion for being a good manager, "I guess you could say I'm a good lab manager," says Vitetta. One measure is that 63 of the 67 postdocs and students trained in her lab have survived in science. She stacks up by other criteria as well—she has several major National Institutes of Health grants, is director of Southwestern's Cancer Immunobiology Center, and has won numerous awards.

Being a good manager has been critical to her success, she says, but learning how to manage hasn't been easy. Vitetta and many other scientists in academia and industry say that they had to learn how to manage postdocs, graduate students, and technicians right from the start of their careers to survive in science. And that skill became even more critical as they gained seniority and rose to the highest levels of their professions, where they also have to manage their peers—as department chairs or as research managers in industry, for example. It is a skill that was not part of their training. "In academe, important positions that in any other organization would be regarded as management positions are occupied by people who do not recognize, understand, or sometimes even want management as part of their job," says Roland Schmitt, former president of Rensselaer Polytechnic Institute in Troy, New York.

Running a big lab, for example, can be as complicated as running a multimillion-dollar business. Managers have to apply for grants; keep the books; hire and fire postdocs, graduate students, and technicians; provide scientific leadership; troubleshoot when something's amiss; publish their work and report it at meetings; and supervise the scientists in their labs.

Most scientists learn how to do these things by example—from the scientists they have trained with, who are usually equally unschooled in managerial finesse. But just as Tolstoy noted that all happy families are alike, happy, productive labs tend to have managers with a lot in common. *Science* interviewed a dozen such scientists—many of senior rank—to find out what they are doing right.

Hiring. First of all, managers have to pick the right people to work with. David Bishop, who supervises 12 Ph.D.s as head of the Microstructure Physics Research Department at AT&T Bell Laboratories, says that before he takes on a new person, he spends a lot of time thinking about the directions he wants his group to grow in. He considers his hires a measure of his worth as a manager: "You're really only as good as the people you've hired in the past 5 years."

Careful screening of potential workers can prevent major problems. Duke University neuropharmacologist Rochelle Schwartz, who runs a small lab, says she learned that lesson early when she hired a technician with lukewarm references who proved to be a difficult worker. Now, she checks references religiously. "Even if a reference is neutral, you can tell a lot," she says.

Good housekeeping. Having assembled your cast, says Vitetta, "you have to provide a reasonable sandbox for your people to play in." For Vitetta, who has 40 people working in her lab designing monoclonal antibodies to seek out and destroy cancer cells, that means being extremely organized. She has centralized supplies of all lab reagents and other materials, and has put out detailed guidelines on everything from making reagents to keeping inventories up-to-date.

It's not just the reagents that have to be handled properly. So does the money. "People have to have a very clear appreciation of what it costs to run a lab," says Vitetta, who gives researchers a monthly allowance that they can spend as they want. "If you order 100 SCID mice at $40 each, it better be a damn good experiment." Her researchers, she says, "learn very early on how to make group deals for fetal calf serum and how to share mice."

Orderly management is also a fraud deterrent. When Schwartz of Duke was doing a postdoctoral fellowship at the National Institute of Mental Health, she saw another researcher record altered data in a lab notebook. She says: "It became so clear to me then what can be done to avoid that. Every little thing—even scribbled sheets—goes in the lab's notebooks. The originals stay here. And I make sure I go through everyone's daily experiment data sheets."

In the private sector, being organized can include sheltering one's lab workers from bureaucratic paperwork. Bishop says that "I try to keep the burdensome nontechnical tasks to a minimum." Looking after logistics takes time away from his own research, but makes for a more productive group than it would be if it were every one for themselves.

Tight teamwork. Efficient lab managers all stress teamwork. One way Vitetta ensures a harmonious environment is to give workers separate, noncompeting projects to work on. She sees little value in a cutthroat environment—for example, where postdocs and graduate students are pitted against each other on the same problem. "The upside of this is that the project gets accomplished fast," says Vitetta. "The downside is that

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Lab reunion. Immunologist Ellen Vitetta *(12th from left, middle row)* counts these 55 former students and postdocs, gathered at a Texas-style barbecue, as signs of her managerial success.

for every three people, two disappear." She says she knows of one bright postdoc who got burned out in a highly competitive lab and ended up taking a job that was "below his level." She says: "It's like a dysfunctional family. He'll pass on his bitterness."

Molecular biologist Harry Noller, whose lab at the University of California, Santa Cruz, is exploring the structure and function of ribosomal RNA, encourages informal collaboration, reminding colleagues that the more projects they get involved in, the more papers they'll have their names on. In most of these labs, camaraderie is reinforced by regular meetings where researchers discuss their work. Managers also meet with workers individually.

Some managers also stress the importance of doing things together outside the lab. "Sometimes we take an afternoon, go to the lake with picnic lunches, and have our lab meeting there," says Schwartz at Duke.

Independent investigators. Just as important as bringing smart people together is knowing when not to micromanage them. "The very good people you by and large leave alone and reward" with raises and awards, says Nabil Amer, a condensed matter physicist at IBM's T. J. Watson Research Center in Yorktown Heights in New York, where he manages 28 researchers in the nanoscopic physics group.

"If there's one thing that's emotionally deadening, it's not having an arena where you can be creative," says Bishop of AT&T. "[You can't] spend all of your time worried that the guy above you is going to second-guess you."

Don't be an absentee manager. At the same time, good managers seldom stray too far from the premises. "When you stop working in the lab, you stop appreciating what the problems are," warns Noller. "I try to go in the lab several hours each day." He adds: "It also dignifies working in the lab, so to speak—I don't want to raise scientists who think it's cool to be a scientist flying around to meetings." Staying close to the lab can head off problems. "I'm always very close to the experiments and the data," says Noller. "It'd be very hard for someone in the lab to fake an experiment."

Honest feedback. The people skills required to manage a lab also include being able to handle uncomfortable confrontations. Schwartz, for example, had to tell one researcher that she did not think that person was cut out for independent scientific work. That researcher is no longer in the lab.

Managers should be able to take feedback as well as dish it out, says Bishop, who has his researchers fill out an anonymous questionnaire. Early in this practice, he learned that "I am an opinionated, overbearing jerk," he jokes. But Bishop thinks he's gotten better—he tries not to tell people what to do but to ask them questions that help them see for themselves.

Like good scientists, good managers experiment with their groups to find out what works best for that mix of people at that time in that lab. The bottom line, they say, is to learn as you go. As Bishop puts it: "Part of the problem of trying to be a science manager is that no one ever wrote a book."

–Ann Gibbons

PLANNING AHEAD

Retirement: When to Go And What to Do

Both academia and industry are offering sweet buy-out deals.

Today may not be a good time to be entering the scientific job market, but for many, it's a great time to be leaving it. Both industry and academia, anxious to trim payrolls and unclog the pipeline for younger researchers, are offering tempting early retirement deals. The University of California (UC) system, for example, recently lured close to 20% of its tenured faculty into retirement with incentives such as giving a 55-year-old benefits ordinarily not accrued until age 60 (*Science*, 20 May, p. 1074). And retirees are finding that new communications technologies are making it possible to continue to work and stay in touch to a degree never imagined a few years ago.

In recent years "the whole dynamic of retirement has changed," says John Hansman of the department of aeronautics and astronautics at the Massachusetts Institute of Technology (MIT), head of a committee examining his school's retirement policies. One reason is the aging of university faculties: The percentage of faculty members aged 45 or older went up from 45% in 1979 to 59% in 1989, according to the National Research Council (NRC). Another is that many younger people are retiring as institutions try to cut costs.

Universities once had a sure-fire way of getting high-priced professors off the payroll: retirement at age 70. But in 1986 Congress outlawed mandatory retirement ages in most professions. An exemption for academia ran out last January. As a result, academics have gained new leverage. The law has "actually created a good that didn't exist before—the individual professor now has control over the ability to continue working and can sell it," observes Brett Hammond of TIAA-CREF, the primary retirement fund for academics. Although an NRC panel concluded in 1991 that "decapping" retirement wouldn't have a major impact in academia, some research universities fear otherwise. Committees at both MIT and the University of Chicago, for example, have analyzed retirement patterns and concluded that people will be hanging on longer.

The economic pressures and demographic shifts are forcing universities to take a hard look at how their faculty members view retirement. They are finding that people are attached not only to their jobs, but to a way of life, says biologist Alexander Glazer of UC Berkeley. With retirement, "they essentially feel divorced." They may be cut off from club memberships, committee positions, parking places, library privileges, and lab access.

Schools are now responding to these concerns. The University of Chicago, for example, has finally started providing low-cost post-retirement health benefits. It also offers an early retirement incentive: Starting at age 63, you receive a cash bonus if you commit yourself to retiring 2 years before you do it. Yale University has been using another approach: phased retirement. Professors can continue at half time for up to 3 years, starting at age 62. Harvard University also wants to