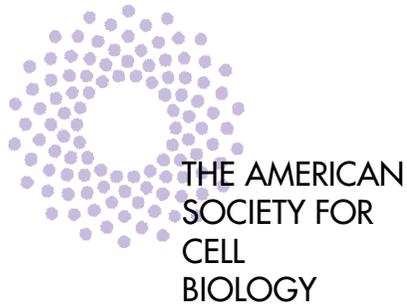


**Life Sciences Research and Teaching:
Strategies for the Successful
Job Hunt**



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Foreword

How To Get A Research Job in Academia and Industry was originally written and copyrighted by Susan Goldhor in 1976, incorporating materials from the American Society for Cell Biology *Women in Cell Biology Newsletter* and from discussions at a series of workshops on the academic job market held at Yale University in 1974 and 1976. Mary Clutter and Virginia Walbot contributed significantly to the original brochure. With the author's permission, the Steering Committee of the ASCB Women in Cell Biology revised the handbook in 1989 and again in 1993. The ASCB

Publications Committee again revised it in 1996. This edition of the publication has been significantly revised and retitled by the ASCB Women in Cell Biology Committee.

Life Sciences Research and Teaching: Strategies for the Successful Job Hunt reflects the current job market and offers practical advice for those seeking jobs in academic research, teaching and industry. The publication is targeted to post-doctoral fellows seeking a first independent position, to students, and to those who work with and advise students and trainees.

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Life Sciences Research and Teaching: Strategies for the Successful Job Hunt

THE JOB SEARCH

How do you start looking for a research job? Most people begin by searching the advertisements in *Science* and *Nature*. Classified ads can also be found in other journals and on the web, or by searching the web for “science jobs.” The American Society for Cell Biology maintains its own free registry. The service provides job seekers the opportunity to post profiles and curriculum vitae (CVs) that can be updated at any time. It also provides company profiles, recruiter profiles and job listings. Members or non-members may search and view the listings for free. Additionally, at its Annual Meeting, the ASCB provides a Career Center, where job seekers may obtain information about jobs available from meeting attendees and exhibitors and may discuss these positions with employers in an informal setting. Career services are similarly available through many professional societies.

In order for you to get an independent job, your application needs to

stand out in a pool of very good applicants. To achieve this, you must first be doing good work. Secondly, you need to be known in the scientific community. For this reason, networking while a grad student and post-doc is vital. Travel, go to meetings, take summer courses, and go to other labs for short durations. Take advantage of e-mail, through which you may also get to know people when you write them for advice or reagents.

Your application will stand out if someone at the target institution, preferably someone on the search committee, knows you. Your advisor is also a good source of employment opportunities through his or her own contacts. If you let people know that you are job-hunting, other faculty in your department, or even some you get to know through meetings or while they are passing through on the seminar circuit, may be in a position to help you. Frequently, through these

contacts, you will be invited to apply for a position. Whether you are invited to apply or apply in response to an ad, the record you build in graduate school, your proposed research, and your letters of recommendation are the flags that make members of search committees stop and take notice. All of these provide mechanisms through which you can demonstrate knowledge and enthusiasm for your science.

ASCB CAREER RESOURCES

- Free job registry at www.ascb.org
- Career Center at ASCB Annual Meeting
- *Career Advice for Life Scientists*, ASCB, 2002

CHOOSING THE RIGHT GRAD SCHOOL AND POST-DOC

There are many different types of jobs for people with PhDs in science. However, the scientific training for these different positions is surpris-

ingly similar. Whether you plan to go into industry, academia, or another science career, you should do everything possible to ensure that you get your PhD and, more importantly, do your post-doctoral work at a top-notch laboratory: an environment where research is preeminent. It provides excellent support and training where the students and post-docs are reading and talking about the literature, are excited about science, and are publishing in good journals. Working in a laboratory where people are doing research that receives worldwide attention, through publications and word-of-mouth at national and international conferences in the field, can be important.

The earlier you begin thinking about a career in research, the better. Doing independent research as an undergraduate is a great way to learn while testing the waters to determine your level of interest. The experience can also enhance your resume and improve your chances of getting into a very good graduate program. What do you do if your undergraduate record does not qualify you for the top graduate programs? It doesn't hurt to apply anyway. If that fails, one

course of action is to get a position at a good research laboratory as a technician. Plan to spend two years in this position. Don't be afraid to start by doing more menial tasks such as washing dishes. Work like mad and take time to be intellectually involved in the research of the laboratory, read papers, and go to seminars. Most PIs will reward such enthusiasm with increased responsibility and independence. If your GRE scores were a problem, study to do better the next time. This course of action will have three rewards. First and most importantly, you will get a stellar letter of recommendation from your boss that can help overcome deficiencies in your grades and GRE scores. Second, you will learn whether you like doing research. Third, when you get to grad school, you will be advanced in experience and maturity over students who arrive directly from their undergraduate work.

Alternatively, if you are determined to go directly from undergrad to grad school and your record does not make you competitive for the very top institutions, enter the best institution you can and find a good lab using the criteria above. Try to be the best

graduate student your advisor has ever had and allow his or her recommendation to carry you to a top-notch laboratory for your post-doctoral



"Actually, I'm hoping what I'm going to be when I grow up hasn't been invented yet."

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work. Your post-doctoral fellowship is the most important determinant in getting your first independent job. You might consider doing two post-docs to improve your scientific credentials; this option is not unusual or detrimental.

When making decisions about labs for graduate or post-doctoral training, it is advisable to research, in advance, how each PI's former graduate students and post-docs have done in the

job market. You may discover a pattern. There are laboratories where every person passing through seems to do a nice piece of research, publish, and find a good job. There are others where people drift, fail to publish, and have spotty employment records. It is up to you to make sure that you maximize your chances by working with a professor who has a reasonable record. Beware of the mentor whose former graduate students have fallen by the wayside, or have had to overcome a weak publication history, even if he or she seems genuinely interested in having you in the lab. If the professor you would like to work with is junior, there will be little student or trainee track record to consider and you will have to trust your judgment. In general, a not-yet-tenured assistant professor is a good bet as a mentor because this person is as desperate to publish and make a name for himself or herself as you are. The young professor will be in the lab more than almost anyone else, will push you like crazy, and will probably do everything possible to help you obtain a good position, because your success will help him or her garner prestige and future collaborators. However, this strategy has its risks.

There will probably be fewer “crumbs from the table,” e.g., giving talks in place of your advisor, co-authoring reviews, or doing other invited activities that can help to get your name known. Also, there is the possibility that the assistant professor will be denied tenure while you are in the lab, which may require you to scramble to change labs or move to a new institution.

THE SEARCH FOR AN INDEPENDENT POSITION

Upon completion of your training, it is important to carefully assess your talents and interests. When looking into job opportunities, consider the ambiance at different types of institutions and attempt to determine what you find appealing. Highly competitive institutions may suit your personality or interests. Or you may have strong social/political/personal reasons to want to bring excellent research/teaching to less renowned institutions or to those with different commitments. The jobs that you apply for should be jobs that you, not your post-doctoral advisor/friends/family, feel genuinely enthusiastic about. Enthusiasm is a major factor in getting, and

keeping, the job you seek, and in remaining happy at your work.

You can learn about available positions on your professional society's website and reading its newsletter as well as the ad sections in journals like *Nature*, *Science*, and *Cell*. Also, many departments have bulletin boards for posting announcements that were sent to members of the faculty. Check these resources regularly and further investigate any institutions with positions that fit your style, your research interests, and your choice of geographical location.

THE APPLICATION

The sections below are written on the assumption that you have targeted jobs at first-rate research and/or teaching institutions. Having located job possibilities, you must now start the process of applying. Usually, this means submitting a CV with a cover letter highlighting your strengths and a brief research summary describing your future plans. Presentation and formatting of the cover letter and CV can make a positive impression on a search committee. Therefore, paper copies of these documents are preferable unless otherwise requested. It

can help a great deal at this stage if a colleague you know can telephone or email someone at the institution to which you are applying and tell them that you are a superior candidate who warrants careful consideration. This will help to differentiate your application from many of the others that the department will receive. Nevertheless, if you cannot arrange this, do not despair.

THE CV

Your CV is one of the critical documents the selection committee will examine as it tries to narrow down a large number of applicants to a handful that will be invited for interviews. For a first job, your CV is likely to be

- S. Rosen and C. Paul, *Career Renewal: Tools for Scientists and Technical Professionals*, Academic Press, 1997.

only a few pages. Make sure that those pages are neat, clear, easy to read, and accurate. Check the final draft carefully for typographical errors. If you have any doubts about

format, ask assistant professors in your department to show you their CVs or to look over yours. (See *sample CV, page 50.*)

The CV typically begins with basic contact information: your name, current address, telephone and fax numbers, and e-mail address. The CV should not include personal data that has nothing to do with your qualifications for the position. After reading hundreds of CVs, a selection committee may use personal data to eliminate candidates either intentionally or subliminally. Gender (if not obvious from

is the number and ages of your children. Information about your height and weight will appear unprofessional. To minimize the risk of identity theft, it may be inadvisable to include your social security number. You may wish to include a brief “Personal Interests” section at the end where you list two or three interests to let your prospective colleagues know that you are a well-rounded individual.

Your CV should include all professionally relevant data. This means your degrees, where and when they were awarded, thesis titles and advisors, professional positions held, membership in professional societies, fellowships, grants, awards and honors, areas of interest and experience in research and teaching, external seminars given, and publications. List any fellowships you were able to obtain to fund your graduate career. Do not include honors (or indeed anything) from high school, with the exception of highly prestigious national awards such as Siemens Westinghouse or a National Merit Scholarship. The emphasis needs to be on your professional achievements starting with your undergraduate years, and particularly any graduate school and



“I see by your résumé that you’re a woman.”

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the name), citizenship, and candidate’s date of birth are fine to include in your CV, although they are not necessary. Your marital status is not relevant, nor

post-doctoral awards and honors. Be sure to include invited talks at other universities, including those that were job seminars (but do not list them as such). Invited talks at professional meetings should also be listed.

In your list of publications, include book chapters and proceedings of meetings, listed in a separate section. Abstracts should be listed separately to avoid being perceived as “padding.” When you have several publications, you might want to drop the abstracts. Be sure to list all articles “in press” (which means you have returned the page proofs), “accepted” (you have made all revisions and the articles have been accepted in final form), “in revision” (tentatively accepted, pending specific revisions suggested by reviewers or editor) and “submitted for publication” (already sent out). If you are applying for a first job, you might want to list articles “in preparation.” However, you may be asked for a preprint or your collaborator may be asked about a manuscript “in preparation,” so do not list something that is not at hand. Keep these listings up-to-date: for example, if a “submitted” manuscript is accepted, returned for revision or rejected, re-label it or drop it.

Be prepared to tailor your CV to the job advertisement. For example, if you are applying for a research scientist job, place your research experiences on the first page where selection committee members can easily see them. If you prepare your CV components as modules of the data listed above, it will be easy to shift the sections around to respond best to a specific announcement.

Many job advertisements request a statement of future research and teaching interests. Even if they don’t, such a statement separate from your CV is an excellent addition. It is to your advantage to re-examine this statement in light of the requirements for each job for which you apply. Tailor it to highlight particular interests relative to any specifics of the job (e.g., molecular genetics, membrane biochemistry), and emphasize how your research and teaching programs would complement those of existing faculty. The research statement should convince the often exhausted reader of application folders that you have a clear, original, and eminently fundable research plan for the first three to five years of your job. In your statement about teaching, it is a good idea to indicate the types of courses you feel qualified to teach

(e.g., cell biology, development, genetics). You can also outline both an undergraduate and a graduate course that you would like to develop, and indicate any unique features that would make them interesting.

LETTERS OF RECOMMENDATION

You will most likely be asked to provide letters of recommendation by a certain date. Whom should you ask? In addition to your thesis or post-doc advisor, perhaps a particularly prominent faculty member or the director of a graduate-level summer program you participated in. The better-regarded the scientist who writes for you, and the better that person knows your work, the more attention the search committee will pay to that recommendation. When you ask people to write letters on your behalf, be sure to acquaint them with the details of the kinds of jobs for which you are applying. In any case, it is essential to determine if the individual is going to write you a helpful letter. Ideally, this will be a “glowing” letter rather than a bland acknowledgment. A negative letter must of course be avoided. This can be a delicate task. However, it is so important that

if you are unsure, it is best to just come out and ask, “can you write me a good letter of recommendation?” It helps to ask in person, or at least by phone. The expression on a person’s face and tone of voice can tell you a great deal. At best, recommenders will tailor each letter to fit the job you are seeking, but more realistically, they will probably compose a single generic letter and re-use it for each recommendation. You should supply recommenders with your CV and publications, and include a brief cover letter to the recommender mentioning a recent achievement that you would wish them to cite in their letter.

If the institutions to which you are applying seem to lose interest in you as soon as they have received your letters of reference, it may be that you are being eliminated because of a bad letter. In theory you have the legal right to read your letters of recommendation. However, this course of action can generate ill will on the part of your recommenders, and perhaps your prospective employers. If you suspect that an unfavorable letter is derailing your job search, ask a colleague that you know at one of the institutions to which you have applied

if there are problems with your application. They likely would be willing to advise you to seek new recommenders. Keep in mind that some recommenders are more critical (some would say more honest) than others. The search committee recognizes this. Also, keep in mind that a letter that points to a genuine but minor flaw may not do you a disservice; indeed, it may add credibility to an otherwise enthusiastic recommendation.

You may discover that you are being undermined by someone you could just as easily leave out as a reference, or be replaced by someone else. This is complicated if this is your thesis advisor or PI, although still not hopeless. First, try not to be too upset, because it happens more frequently than most people realize. Second, if you are far enough along, and have other people to write on your behalf, you might consider leaving that particular person out, no matter how big a role he or she played in your career. Third, you can occasionally have one of your other references, or someone who knows you and knows someone at the institution to which you are applying, call up and warn them that a

letter of this sort should be expected but not believed. This may even work to your advantage. Your prospective employers may feel sympathetic and also experience a sense of nobility at rising above someone else's unfortunate prejudices. More practically, they may recognize that you are capable of working productively in a non-ideal environment. And, of course, it will distinguish you from the crowd of other applicants.

THE COVER LETTER

The cover letter almost always accompanies the CV in a job application. There is no standard format for the cover letter. This can be an advantage, because it provides a chance to present yourself to the search committee in the best possible way.

The cover letter should present *concisely* your major accomplishments and where you plan to go with them. It should announce to the search committee why you are the best candidate for the position, or, at least, why you deserve an interview. Never forget that institutions have egos, and can be insulted. The aim of the letter and, indeed, the whole elaborate ritual of searching and hiring, is to suggest

that this particular institution is so well known, or so well known in your field of interest, and so excellent, that you have been attracted by it, and wish to improve it further by joining it. Naturally, you have to do this without sounding phony and you must show the humility appropriate to a prospective junior faculty member. However, at the same time you should indicate that you are perfectly confident in your own abilities and that you will be a great success should you be hired. A problem that applicants often create for themselves in cover letters is a tendency to present themselves in an overly humble manner. By downgrading yourself, you are indirectly insulting the institution that might hire you. As in personal relations, institutions tend to take you at your own self-evaluation. Ask a faculty mentor to critique the cover letter.

The concluding part of the cover letter typically lists the names of three to five people who have agreed to provide a letter of reference (or recommendation) on your behalf. If the letters are requested in the job listing, ask your referees to send them as soon as you apply. If the listing asks for

names only, then wait until letters are requested before asking that they be sent in. At some institutions, Equal Employment Opportunity regulations require that search committees consider exactly the same number of letters of recommendation for each job applicant, and extra letters are not made available to the committee. Therefore, read the application instructions carefully; if they specify an exact number of letters, then only list that number of recommenders, and only contact those people for letters for this application. You don't want your best letter, often the one from your post-doctoral mentor or thesis advisor, discarded because it arrived after less important ones.

THE DUAL CAREER HUNT

Couples in which both partners are scientists may find themselves looking for jobs together. Although there are many different dual career situations, most can be characterized in one of two ways: where both spouses are at approximately the same level of their careers or where one spouse is more well-established. Some geographic regions are more densely populated with research institutions than others. On the surface, regions

rich in research institutions might seem more hospitable to a job-seeking couple. However, different institutions are very unlikely to work together in recruiting. Thus, in such a situation, the two of you, if you are considering different institutions, may have to obtain independent offers that are both acceptable and are both available at about the same time. It is generally easier to negotiate two positions within a single institution, either within the same department or in different ones. Indeed, an institution that is not surrounded by other research centers may work harder to accommodate a spouse, knowing that they are the only game in town. The institution should also be able to provide information for the non-scientist spouse. Find out if there are suitable positions on campus or with relevant organizations or companies in the area. Ask if anyone in the department has contacts at businesses of potential interest. The department may be able to provide you with leads for available positions, or, at the very least, direct you to the appropriate person or office for help.

Initially your job search should not differ from the search of an unat-

tached individual: simply apply aggressively to obtain an interview. It is not advisable to bring up personal considerations or complications in your initial written application. At the interview, the fact that you have a spouse or partner who is seeking a job will almost certainly come up. If asked directly, be honest. The scientific community is fairly small, making it likely that your interviewers will know your situation before you arrive. If they seem to be unaware, you can mention it in casual conversation.

Once you are successful in obtaining a job offer, drive the best bargain you can before you accept the appointment and arrive at the institution. After a search committee has invested the time and energy and decided that you will make a good colleague, they will do everything in their power to accommodate your spouse/partner rather than lose you, so your leverage is much greater before you physically arrive than after you're already there. The two of you may have to make compromises, so it will help if you make decisions beforehand about your idea of acceptable positions and trade-offs.

The most positive outcome of the dual

career hunt is when both of you get exactly the job you want. A close second is one in which the institution is extremely eager to attract one spouse/partner and makes good accommodation for the other. In this situation, it is best to overcome the tendency to bemoan the perception that, “they only want me because of my partner.” Instead, see the appointment as a challenge and use the opportunity to show your colleagues that they were wise to recruit you as well.

A third situation is where one partner accepts a tenure-track position and the other takes a research track position. Although ready for an independent position as a lab head, the less well-established partner accepts a research position such as a non-tenure track faculty appointment, a lecturer or instructor job, or even a senior post-doc position. This move is usually seen as a temporary measure to be resolved once you are settled in the new location. It can be beneficial if, for example, you want flexibility to start a family. However, if this is a less-than-optimal position from your point of view, be aware that no matter how it may be pitched to you, realistically it may be

difficult to advance into a tenure-track post after you have arrived. Once in town, you become a “known commodity” and “captive spouse”. This view may be exacerbated if you are working in your partner’s lab. When openings arise in tenure-track positions, you will usually have to compete with outside applicants who may appear to be exciting potential colleagues to the search committee. (Remember the old adage, “an expert is someone from out-of-town with slides.”) The more established investigator may feel that there is little option but to threaten to leave for a position elsewhere, to open up a position for a spouse/partner. This card must be played with great caution since you must be willing to move to the new institution if your requests are not met.

A possible strategy when one spouse is well-established and the other is less well-established is for the latter person to be the primary job hunter. An institution making an offer in that case is often delighted to be able also to attract the well-established member. However, this strategy may prevent the couple from optimizing their job options.

The dual career couple should have a realistic plan that takes into account the strengths and priorities of both partners.

THE INTERVIEW

Institutions that are interested in your application will invite you to visit them, at their expense, for one to three days. If you apply for many jobs in a few months, you may wish to also apply for several credit cards to charge airline tickets; if you go on interviews you may be financially pressed to purchase multiple airline tickets up-front, and some schools require six weeks or more to reimburse you. You should not expect honoraria.

Do your homework before you go. Check the Web for descriptions of the research programs of faculty in the department recruiting you and in related departments. Know at least the general area of research interest for each faculty member in the department. You will make a much better impression if you can say, "I am familiar with your work in X", rather than "What do you work on?" Ask to speak with specific individuals in your field and others with whom there is potential for interaction, and

with post-docs and students. It is also important to speak one-on-one with individuals who have been hired within the last few years to gauge their satisfaction. If possible, procure your interview schedule before leaving so you know with whom you will be meeting. Review the recent publications of your likely interviewers and think of some questions to ask each one. When you are interviewed, don't necessarily tell the individual that you have just read their recent publications, but let it come out in your questions that you are familiar with the field and their work.

You will probably be shuffled from office to office for at least a day, in a series of interviews with individuals or small groups of faculty members and, perhaps, graduate students and post-docs. There is nothing worse at such meetings than an embarrassed silence, and it is up to you to prevent it. If you are able to schedule your seminar so that it occurs before these interviews, it will be a tremendous help because it will provide material for conversation. On the other hand, some of these people will be in fields so far from yours that your seminar will be almost incomprehensible to them; others will not have liked it,

and there are always a few who couldn't attend. These people are waiting to hear what you have to say, and what sorts of questions you ask them. Here is where the candidate who has done her/his homework will reap the greatest awards. You should have intelligent questions ready that will let the faculty know that you know their work and have broad interests. With faculty close to your own interests, look for areas of collaboration and areas of competition. If you do not know the person's area of expertise, ask them about their latest results.

If you find yourself in a situation in which you cannot maintain an active conversation about your research or that of the person to whom you are talking, ask about 1. shared equipment and facilities, journal access, animal facilities, greenhouse, etc., 2. the students, the graduate program and the administration, 3. housing prices, 4. how to get a cup of coffee, 5. recreational facilities or cultural opportunities in the community. The main point is to show interest in the person and their environment. Before you have an offer, it is probably wise to refrain from initiating conversations about things that make your situation look even slightly compli-

cated (daycare, a job for your spouse). Interviewers are not supposed to ask you about these or other personal matters. However, not everyone is aware of the legal niceties regarding job interviews. If you are asked such questions at your initial interview, be honest but positive about being able to overcome any prospective difficulties in accepting a position at the institution.



"Thank you, sir. I am proud of my resume. And I think you'll find that most of it is true."

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At this stage of the proceedings, before a job has been offered to you, do not attempt to settle contractual details. However, you may ask about available lab space, teaching duties, length of contract, chances of earning tenure (this may require some clever deduction on your part, rather than outright questioning), journal access,

laboratory facilities, shared equipment, institutional research funds, etc., in a general way. You are likely to have a meeting with the department head and possibly the search committee, and these are appropriate venues to raise these questions. In advance of your visit, make a list of the major facilities and equipment you require and note who in the department controls each piece of equipment. If asked for your needs, be comprehensive. Do not overlook dishwashing, autoclaves, distilled or deionized water, cold room, warm room, darkroom, and administrative and shop services. If your research requires animals, find out about animal care costs and what assistance you can expect in carrying out your experiments from the animal facility staff. What joint facilities are available for production of molecular biology reagents, monoclonal antibodies, transgenic mice, etc.? Does the department subscribe to your first-choice journals? Do you have free access to electronic subscriptions? If you need special culture facilities for your organisms, check on availability. If you need greenhouse or growth chamber space, determine whether the institution can accommodate your specific requirements, and what the recurring

costs are to you. Will major renovation be necessary to make the space useful for your research program, and is the institution prepared to pay the costs? Don't be overly concerned with small details at this point. However, your interest in everyday life and conditions at the institution sends the message that you would seriously consider accepting an offer.

Request a meeting with students. Are they satisfied with the department? What do they think are its strengths and weaknesses? What do most students and post-docs from the department do after graduation? Are there training grants for student and post-doctoral support to which you will have access? Are there institutional student fellowships? Are some students supported by independent fellowships (such as NSF or Howard Hughes)? Are some students supported as teaching assistants or are most paid from their advisors' grants?

There will be times during interviews when you will feel absolutely exhausted, and you are sitting in the office of someone for whom you feel trust and rapport, and you want to

let down your guard. Do not do it. Never forget that you are being interviewed all the time. You will be held accountable for everything you say. For instance, comments dropped to the graduate student who drives you to the airport may be repeated. No matter what schisms and animosities the faculty members may display, they are still a group, bound to each other by a complex network of ties, and you are still the outsider. Informality can be fine, but indiscretion is not. Never let your guard down or forget that you are being interviewed until you have the job.

If you have other offers or interviews at good places, it may help your case if the institution knows about this, but such information must be worked into a conversation smoothly so it does not appear that you are pressuring this prospective employer, or uninterested. On the other hand, if you have applied for many jobs and this is your only interview, do not say so. They will think they have made a mistake in inviting you. If asked directly about your prospects, you can say that you are exploring a number of options—period. Never imply that you are relieved or grateful for the in-

terview. This will make you appear desperate and less desirable. Even if you do get the job, your negotiating power will have been reduced. You must also be guarded in your comments when changing jobs. Everyone will want to know why you are leaving your present position. Emphasize how attractive you find the job for which you are interviewing, rather than how awful you find your current job. If pressed, you might state that you wish to live in another location, or that at your institution there are too few colleagues in your field. If there are professional opportunities for your spouse at your prospective new place of employment, it won't hurt to mention that fact. But other personal reasons you may have for wanting to move are none of their business, and any professional ones are better left unstated. If you are a post-doc, the reason for looking for a job should be obvious but, again, do not let any complaints about your university, lab, or people with whom you are working come out even to the most sympathetic listener. It cannot possibly help your cause and may get you labeled as a malcontent. Try also to limit negative chatter even to colleagues at other institutions—word

can travel quickly back to your prospective employer.

On the practical side, try not to exhaust yourself. You cannot be at your best if you are tired. Interviewing can be a grueling process. Dress neatly and professionally but be comfortable. You should be sufficiently at ease in what you are wearing to be able to forget about it. This is unlikely if you are in jeans and everyone else is wearing a suit, or vice versa.

Be careful of alcohol. It is probably best to avoid it since you will tend to be very tired at the end of the day. Try not to schedule interviews at two institutions back-to-back. This is both to save your energy, and to assure that you can give each institution the time they and you want together for the interview. When a party in your honor looks as if it might go on all night, ask to be taken back to your hotel. Be sure to say a polite goodbye to your hosts before you leave. If you desperately need a nap or shower before dinner and your hosts haven't built any free time into the schedule, ask for it. Preferably this can be anticipated by reviewing your schedule in advance.

They will often be grateful that they do not have to fill every minute of your available time.

THE SEMINAR

You will almost certainly be told that you are expected to present a seminar. If not, ask, and find out how long your presentation will be expected to last. Make sure your hosts are aware of your audiovisual needs in advance of your visit. If you will be there longer than one day, and, if you have any sort of control over the dates, try to ensure that your seminar will be given on the first day of your visit. This confers two benefits. First, you will be relatively fresh and rested for your presentation. Second, when you are stuck in someone's office a day or so later for an hour-long tête-à-tête, the other person will have some ideas about your work, and the conversation will flow a lot more easily.

Make sure ahead of time that A-V equipment will match your presentation format (LCD, 35 mm or overhead projectors). If planning a Powerpoint presentation, check whether you need to bring your own laptop computer and whether they have the correct cable for connecting

your computer to the projector. Check whether their LCD projector has sufficient resolution to handle any graphics or text slides you plan to show. If not, use slides or overhead transparencies of material that will be difficult to read from a low-resolution projector.

As to the seminar itself, there is no excuse for you not to be totally prepared and give a superb presentation. You will have found out what length is expected for your seminar. Be sure that it is no longer. It is essential to practice in advance. Go through your talk several times with different audiences, preferably critical ones such as your fellow graduate students or post-docs. After working for years to get good data, you may feel that it is so compelling that your talk will be exciting whether or not you practice your presentation. Good data is essential but it is not sufficient. You have to convince your audience that both your data and ideas are good and interesting. It is useful to get feedback from people familiar with your work and also from some who are less familiar with your field, as they will be more likely to point out where you have glossed over vital background infor-

mation. At practice sessions, encourage the audience to ask difficult questions so you have a chance to practice these skills.

This seminar differs from one presented to colleagues in your field in an important way. A job seminar may draw individuals who are outside your field, who must be won over to the importance of your work. Indeed, you may be of interest for this job because the department is missing a representative of your line of research, i.e., there may be no single person in the audience who really understands the details and significance of your work. Therefore, a ten-minute introduction to the area for a general audience, pointing out why your work is new and significant, is well worthwhile. Frequently some of the most powerful senior faculty will know the least about your field. They are an important part of that “general audience.” Highlight data or techniques in your research that provide potential for collaboration. Some people feel (unnecessarily) that they must have personally done every experiment that they present in a seminar. But, you will need to provide background work done by others,

from other labs or members of your lab, that ties in well with your own; just be sure to properly credit the models and data of others.

Design your visuals carefully. There is a temptation with Powerpoint to use many colors and many animation styles. These make images very “busy.” Keep it simple, with one major point per slide. You will probably have about fifty minutes for your talk. This requires a very different approach from the ten- or fifteen-minute slot at a large meeting where you simply spew out the data as fast as you can to a dark room. If your work could fill fifty minutes of fast-spewed data, do not present all of your work; no one will be able to follow it all anyway. Instead, present one or two major lines of your work in the most interesting way possible. You may mention that you have also accomplished such-and-such, and would be delighted to discuss it after the seminar with anyone who is interested.

An hour or so before seminar time, check the audio-visual set-up: download your Powerpoint presentation to the hard drive of the computer you

will use, and test whether the connection to the laser projector is working correctly. Familiarize yourself with the function of the room lights and the microphone.

Make sure there is water available on the podium but without ice; the clinking can be amplified by the microphone, and it can numb your mouth.

During your seminar, unless some of your images absolutely demand it (e.g., fluorescent images of very fine structures), do not turn the lights way down or out, because some people may fall asleep. Powerpoint allows you to make the slide background color light, keeping the presentation clearly visible without darkening the room. If you have some dark slides, remember to turn the lights back up immediately after you show them. Face the audience as much as possible while talking, make eye contact with those who show the most interest, and make an effort to have your voice loud and clear. Bring a laser pointer.

It is common to be nervous while presenting a job seminar. If you may have trouble remembering what to say under pressure, write it all out but do not

read it, except as a last resort. There is a difference between a really good, well-prepared seminar and a canned seminar. A presentation that is either read or memorized word-for-word usually is deadly! One useful technique is to memorize the first few lines and the concluding summary of your talk. In between you can speak more extemporaneously. Design your slides with good, clear, short titles—this will cue you, and make your talk easier for the audience to follow. Slides that summarize the main point of each sub-section of your talk are also useful: they can reinforce your conclusions in a logical order, and help you and your audience follow where you are going with the talk.

Remember all the tedious seminar speakers you have been forced to listen to, and try not to repeat their mistakes. Enthusiasm is the first ingredient. If you are not excited about your work, no one else will be. Think about the good speakers that you have heard, and try to analyze why (apart from the Nobel quality of their ideas) you thought they were good. No matter what agonies or fear of embarrassment you may suffer, try to present your seminar as if you are enjoying it. If jokes come naturally, use them but do not force them

into your seminar just for the sake of humor. If you are comfortable using humor, it can be very powerful in getting the audience on your side. Even a failed joke will elicit some sympathy and gratitude for attempting to liven things up. If you made a funny or a serendipitous mistake that led to interesting data, tell about it. These people are not looking for a computer, they are looking for a colleague: a human being with whom they will talk, work, and attend parties for up to forty years. If a mischievous sense of humor is one of your major qualities, and you manage to suppress it totally for three days and get hired by a stodgy, humorless department, what have you gained? You will end up suffering if you are a misfit.

At the end of the seminar, summarize your major points, make conclusions, acknowledge your advisors, mentors and source of support, and indicate future directions of your research. About five minutes should be devoted to this summary. When your seminar is over, there will be a question period. A good way to make a smooth transition is to thank the audience for their attention, and tell them that you welcome their questions and comments. Sound as if

you mean it, even if you aren't sure you do! Some of the questions may indicate that the questioner has missed a very basic aspect of your talk. Be diplomatic, never insulting, with your answer. It will give you an opportunity to reinforce that aspect of your seminar. In other cases, you may feel that the questioner is hostile. It is unlikely that this is true. The real point of this question period is to see how you think on your feet, how self-possessed you are, and how you handle this sort of situation. If someone should sound hostile, you ought to give the impression of enjoying the challenge—never show anger or lose control. If you do not know the answer to a question (or when a factual answer does not exist) you can still respond positively, which will serve the dual purpose of making you look good and saving face for the questioner. For example, you can say, "No, I haven't tried that, but so-and-so published something very similar in the last issue of *Molecular Biology of the Cell*, and showed that . . .", etc. This shows that you keep up with the literature and that the person asking the question or suggesting the approach has a reasonable point. You can also say, "I don't know the answer, but the problem might be approached using such-and-such a new

technique or system." This shows that you think about such problems and/or that you think fast. Never say, "I don't know, that's a hard question," (end of comment), and never imply by your tone of voice that a question is stupid. A lack of questions can be unnerving; it is handy to have a question or comment of your own to get the ball rolling in that situation.

Ask if you will also be expected to give a more informal "chalk talk" and if so, how long it is to last, and on what topic. Be sure that you know if the time specified is meant to include questions and discussion or not. Typically, the chalk talk is an opportunity to expand on your proposed research as you might in your first grant proposal. It is a common aspect of a first or second visit. As the name implies, this is typically meant to be less formal than your seminar. This part of the interview is meant to determine, among other things, if you can think on your feet. Those present will also want to know whether you can generate hypotheses, how well you know the strengths and weaknesses of your experimental techniques, and how well you know what other investigators in the field

have done and are now doing. If some members of your audience missed your seminar, or just as a review for the entire group, especially if the chalk talk is on a subsequent visit to the institution, you should take a few minutes at the beginning to reiterate main points or approaches. Also, if you had the sense that your explanation of something was suboptimal in your seminar, or left some listeners confused, you may want to very briefly fix the problem at this time. You may actually be expected to use a chalkboard or whiteboard to outline the next three to five years of your proposed research (or whatever topic you have been asked to address). Alternatively, if your hosts agree, you may be able to use overhead transparencies. If your handwriting is atrocious, and even writing out the material in advance can't improve it sufficiently, ask prior to your trip if you may use printed transparencies.

The chalk talk is often a defining event; if you are not ready to strike out on your own scientifically, this session becomes uncomfortable in a hurry. On the other hand, if you know what you're doing, cross-fertilization of

ideas and opportunities for collaborations develop with the assembled faculty members right before their eyes.

Reflecting on your talks, don't be hypercritical of your own performance. Whatever happens, remember there is no such thing as a perfect talk. Good presenters learn something from every seminar they give and use it to improve the next one.

THE OFFER

During the months that follow the interview, before the institution has made its decision, it would be wise to keep in touch, taking care not to be pushy or annoying. An ideal way to do this is to send the committee chair or a colleague reprints or preprints of your papers, should you be so fortunate as to have some published in this period. You are trying to keep your candidacy in the minds of the people you met.

One day you receive a telephone call from the department chairperson offering you a job as assistant professor at a specified salary. Of all the institutions at which you interviewed, you prefer this one. Furthermore, the people you met struck you as being

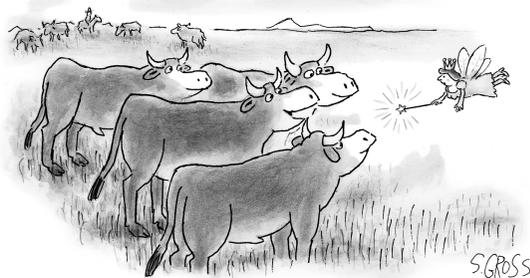
decent and honorable. Your initial impulse will be to shout “yes!” on the spot, write letters of rejection to all the other positions for which you are currently being considered, and throw a huge party to celebrate. Do not do it. Be prepared for this telephone call, and resist the impulse to accept instantly. Instead, tell the chairperson that you are absolutely delighted, that you are very interested in joining his or her department, and that you will seriously consider the offer. Ask about the timeline. Almost certainly the next step is that you will be invited back for another visit.

On this trip, the shoe is on the other foot. Whereas before you were trying to impress the department and institution, it is now their turn to try and impress you so that you will accept their offer. On this visit you should make clear everything you expect and what is expected of you. Meet with all the faculty of the department, particularly those you were unable to speak with during your first interview. Take this opportunity to ask probing questions about the politics of the department and institution. Find out precisely what you can expect in terms of lab space and start-up funds. If you are asked to provide a list of

needed equipment, be sure that it is complete for the experiments that you have planned. It is unlikely that you will get everything you request, but it is even less likely that you will get more than you request.

THE NEGOTIATION

While at this point you can afford to be ambitious, remember too the importance of humility. Negotiate aggressively, but be respectful. Verbal offers can be withdrawn either out-



“We would like to be genetically modified to taste like Brussels sprouts.”

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right or indirectly. If you succeed in turning everyone off at this stage, you may find that none of the resources you request can be made available—forcing you to withdraw as a candidate so the institution doesn’t have to withdraw the offer.

■ *Getting a Feel for the Place* How are people treated in the department you are considering? Are technicians' salaries paid during breaks in funding? Does the department have money for post-docs and graduate students? Have people been left with tenure but no department and, therefore, no space and no salary? These are critical factors to learn and they can be asked in a non-confrontational manner, which is always the best approach.

Bringing up these issues may seem adversarial and you may feel uncomfortable asking about them. Don't. Your initial feeling may be that if you request anything more than what is offered, and if you ask a lot of questions, the offer will be retracted. This is exceedingly unlikely. They have spent a great deal of time and effort and money searching for a colleague, and after looking over hundreds of dossiers and as many candidates as they could afford, after sitting through many boring seminars, and, even worse, search committee meetings, after arguing and compromising up and down the institutional hierarchy, they have finally found their person: you. You represent the end of a tiresome, tedious, and expensive

search. They want you. You can afford to request a few concessions (or "resources") from them now.

- C. L. Karrass, *The Negotiating Game: How to Get What You Want*, HarperBusiness, 1994.
- R. Fisher, *Getting to Yes: Negotiating Agreement Without Giving In*, Penguin USA, 1991.
- *Career Advice for Life Scientists*, ASCB, 2002.

■ *Salary* Most schools base future cost-of-living increases, merit increases, etc., on your starting salary, so it is important to negotiate for the best possible salary at the start. See if the institution can make data available for salaries by rank, years in rank, degrees, and department. You may be able to get this information from the department chair or the administrative assistant for the department, or the human resources office. Seek the

highest salary possible: studies have shown that the party who aims higher in a negotiation ends up higher, as long as the negotiator operates within a reasonable range; whereas those who start lower end up lower. Talk to your friends who have recently been hired in comparable positions to get an idea of salary level and benefits. In addition, or alternatively, look at average salaries for that region of the country and by rank and department using data from the American Association of University Professors or the American Association of Medical Colleges. Adjust your expectations higher or lower to account for the cost of living in the new location, or determine that the data you are reviewing already account for it. A New York salary may sound great until you see what you will have to pay for adequate housing, transportation, schools, etc. Websites such as Homefair.com compare costs of living across different cities. Then set your target salary somewhat higher than the data suggest you should earn, and open negotiations at that level. At minimum, hold out for the median. Many find this sort of haggling difficult and painful. Although you may disagree with it, the system you are about to enter judges

you, at least partly, by salary. By acceding easily to a low salary, you are hurting your image in the eyes of your colleagues and supervisors. Don't be afraid to offend; as Jack Nicholson's character says in *Prizzi's Honor*, "It's only business". After years of graduate student and post-doctoral fellowships, almost any salary will look good. Remember you will want to maintain a different style of living, that your tax base will change, and that your salary may, over the long run, have to maintain

- American Association of University Professors
www.aaup.org
- American Association of Medical Colleges
www.aamc.org
- Homefair.com
www.homefair.com

dependents as well as yourself. Many young people rationalize accepting low salaries on the somewhat contradictory grounds that either they are

single, and therefore have only themselves to support, or that they are married, and therefore are sharing their income burden with their spouse. Since your future salaries may depend upon this first one, you should keep in mind that even if you have no current dependents, you may someday have them. More to the point, you should be paid according to your worth in the labor market, not your personal circumstances. Your parents or a sibling may require financial support from you. You may, in the future, have children; you may be divorced or widowed and/or have to support an unemployed or disabled partner. So argue for the highest salary you can fairly get, with a clear conscience and the knowledge that you are worth it. Short of engaging in the equivalent of corporate espionage, there is only one way for you to find out what you can get: test the market. Ask for the higher salary, the larger space, the added equipment. If you are told no, offer creative solutions. For example, you might accept an average base salary but negotiate a bonus to supplement your take-home pay without obligating the department to a higher base salary in perpetuity.

■ *Benefits* Don't dwell on just salary; look for ways to improve your whole compensation package. The more you try to find creative solutions to your requests, the more they will understand that you are serious. You may be surprised when some, or all, of the formerly "limited" or "non-negotiable" items somehow become available. Ask about the available benefits. They may include moving allowance, retirement benefits, health coverage, dental coverage, subsidized housing or sub-market rate loans, day care, etc. The institution may have a cooperative arrangement by which they provide a significant proportion of the purchase price of a home to be repaid when re-sale occurs. These benefits may add significantly to the value of your salary. Moving allowances can vary, so estimate your moving costs in advance and then ask for complete coverage. Try to get a sense of the aspects of your compensation that are most readily negotiable. Typically, different elements of your compensation, such as salary, retirement and housing loans or allowance, come from different sources, some more flexible than others. For example, the salary range for junior faculty may indeed be limited. But the institution's contribution

to your retirement may be open for debate. Even if you have to accept a more modest salary than you had hoped, if more is being put aside for your retirement, this can compensate.

■ *Start-up Funds and Facilities* The most important aspect of your negotiations will involve resources for the advancement of your career. Now is the time to ask if there is a manager for the facilities, or if you will be expected to replace lights and arrange for maintenance and repairs. When you are shown your prospective space, make sure it contains adequate water, electricity, gas, on-line air, and vacuum. Are there unsafe features such as floor plugs next to the drains? Have the windows been washed? Are janitorial services regular and adequate? Is it reasonably ready to use, or is it full of discarded equipment and the ancient reagents of previous occupants? Do you pay for equipment hook-up and architectural modifications? Will the promised laboratory space be sufficient? Is there any equipment included? Who pays for shipping and mailing, copying, telephone and IT support? Will start-up funds be sufficient to hire a technician and post-doc and carry you through at least a few

rounds of revising your grant proposals? It is essential to be prepared to re-submit a revised proposal after an unsuccessful first try. Ask whether you have to reimburse or forfeit startup funds if you get grants during the startup period. Some institutions will only ask you to give back money attributed toward the PI's salary.

The cost of setting up a laboratory will vary depending upon your needs. Don't underestimate it. It can easily cost \$100,000 to \$150,000 to equip only a portion of a laboratory, for example, to outfit a high quality research microscope or obtain basic molecular biology equipment. You need to carefully consider all the equipment and supplies you will need to get started, even the mundane items such as pipettes and glassware. Talk to colleagues in your field who have recently set up laboratories. This will also enable you to gauge the going rate for start-up packages being offered in your field. You need to factor in what already may be available when you arrive. What existing equipment will they give you, and what equipment is available as a shared resource? Will you be charged maintenance or usage fees for shared equipment? There are

two categories of common equipment: that which is truly common and that which is part of some other investigator's laboratory. Access to a centrifuge two buildings away is not useful. The department head may promise you the use of equipment that another faculty member regards as private property. You could, if you had it in writing, insist on using it, but you may engender hostility, which is not helpful. You may find it better to ask for funds to buy certain equipment that you know you will need, rather than accepting a promise for access to shared or older equipment that may be in disrepair or out-of-date. Many institutions provide core facilities with cutting-edge technology and staff technicians for which you pay a fee and to which all faculty have equal access (e.g., confocal microscopy, flow cytometry). This means that you need not duplicate the technology in your lab and it frees up your funds and space for other uses. It is these sorts of things that must be scouted during the post-offer visit.

Be sure to see the space where your laboratory is to be located. Is it near colleagues with whom you can interact? This can be critical for a starting faculty

member who will have few post-docs and grad students with whom to discuss new ideas. Negotiate hard for needed renovations at the expense of the institution to be complete prior to your arrival. They are invariably expensive, and departments usually budget for funds to renovate space for new recruits. If your prospective laboratory is occupied or undergoing renovation, obtain a firm date in writing when it will be available. Delays will happen, but your ability to rise higher on the list of departmental and institutional priorities will be greater if you have a firm date and promise in writing.

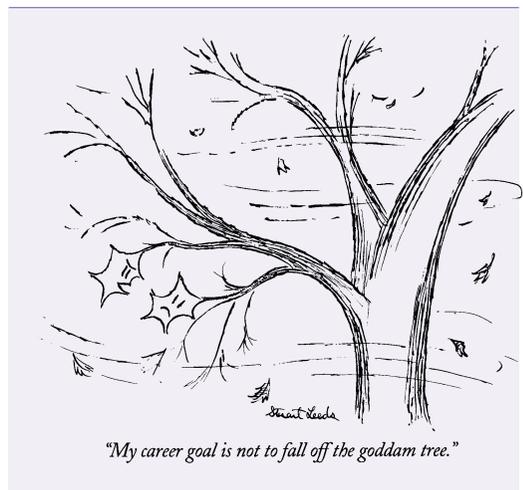
■ *Criteria for Promotion* You must establish a firm understanding of the relative weight of various activities in determining promotion. These typically will be research first and teaching second, but community activities within the institution such as committee service, and outside the institution, such as study section membership or editorships, may also be important. In some research-intensive institutions, teaching is not a major factor in promotion decisions. This may be true even if the institution's policy states otherwise. At other institutions, teaching will be very important. In

either case, you need to decide if the expectation of the balance of research to teaching matches your own priorities. It is best to talk with faculty at the institution who have recently been through the tenure process, both those who have been successful and those who have not. They can also help you gauge whether the faculty, the department, and the institution are supportive of new faculty members trying to establish themselves. A common and tremendously helpful form of support is for the senior faculty to read and critically evaluate a starting faculty member's initial grant proposals.

Another helpful concession to a new faculty member is a delay in teaching and committee assignments to allow time for grant writing and setting up the lab. Alternatively, does the chair expect you to show up grant application or funded grant in hand? If so, this will take a certain amount of time for you, and your institution's grants and contract office. What kind of help will they offer you? When do they expect you to start? The exact starting date can be important due to the year-long cycles of promotion and tenure committees. Find out how the system works. It may turn out that

coming a month early means that you lose a year before you are evaluated for promotion and tenure. If your current position allows it, negotiate for a delay in your starting appointment to allow time to finish papers from your post-doctoral work or to get started on grant proposals.

If you are pursuing an academic career, being offered a job as an assistant professor does not mean you have made it. You have made it to an important step, but you cannot rest secure until you have received tenure or the equivalent of the institution's senior status. Thus, the reason for



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making sure in advance that you have the facilities and the time to do-

search is to ensure that at the moment you sign the contract for your very first job, you are certain that you have done everything possible to give yourself a fair crack at tenure, one or two contract periods hence. There are departments where you may come to an empty laboratory, to use all of your energy in carrying an unusually heavy teaching load and to accept a surfeit of committee assignments, and then will refuse you tenure on the grounds that you have not published sufficient original research since your arrival. Don't let this happen. Find out what activities are rewarded, and prioritize your decisions and your work accordingly. Depending on the institution, your first contract period may be only two or three years. Making preparations before you even arrive on campus is the only way to be productive within this short time.

There are certain excellent universities at which you may be offered an assistant professorship but where you should not expect tenure. If you clearly accept this reality and plan on changing institutions in five years, these can be good job options, but they are risky. Don't minimize the cost of having to set up two laboratories during a rela-

tively short time period and the disruption to your personal life. In addition, most people who claim to accept the reality of not getting tenure at such institutions still suffer from feelings of rejection and inferiority when it happens. Keep in mind that unless you quit first, you will probably be considered and turned down. Alternatively, you may decide that tenure is not a requirement for your career. In some research-intensive institutions including private medical schools, there are research opportunities that may fit your goals better than the traditional academic tenure-track position. You may want to investigate whether there are points at which you could move between the tracks and continue your work within the institution.

- *Confirming the Offer* Ask the Chair to confirm all agreements in writing. It is critical that you receive a detailed appointment letter before you arrive, because well-intentioned people can honestly differ in their recollections and because you don't want promises made during the glow of interviewing and negotiations compromised. The appointment letter itself may be signed by the Dean or President or CEO. Offer to draft what you under-

stood to be offered to you for the Chair to use in the letter to you. Include every detail discussed, in list form, from the location and square footage of your lab, to the timeline for tenure, to the administrative support to be provided by the department.

- *Personal Arrangements* Don't forget to attend to the non-scientific aspects of life before you arrive. Find a copy of the town newspaper. What kind of cultural events are listed? Do the stores advertise things you buy? How much does housing cost? If you have children, does the university have a child-care center, and can you enroll your child? Where are the best school districts? On the post-offer visit, arrange with a real estate or rental agent to look at apartments or houses, unless there is campus housing available and you plan to live there. Investigating the local housing market is especially important if you are not familiar with the area where the potential job is located. Consult the sites of the local and state Chambers of Commerce to get other information on the area.

Check into subsidized faculty housing. Find out how long the waiting list is and

get on it. If faculty housing exists, you will probably never need it more than when you just arrive. It usually has the additional advantage of a short-term lease, so it is a good place to be while you look at other options. If you can, especially if you are moving to an expensive city, indicate in your contract that you won't start until you have housing. This can save a lot of time and energy that you will need for setting up the lab.

- *The Contract* At this point you will sign the official institutional contract, which is countersigned by the Dean or President. Congratulations! You have finally been hired. Now, and only now, you may telephone or write to the other institutions that have been considering your candidacy, and tell them that you have accepted another position. Remember that a verbal or even a written offer from the department head is not a legally binding contract. There are cases where the candidate was offered a job by phone and told that a formal offer would follow, but it didn't. The lesson is that it is imperative to have the offer in writing, signed by the appropriate institutional official.

You are now aware of the amount of

energy, time, and money that both sides must put into a contract. A careful consideration of this, as well as of the economics of the job market, strongly suggest that you should not apply for a job that you do not want. No matter what difficulties you have had in getting the appointment, the fact that you have been offered one suggests that you will probably be offered others. In fact, you may be at your most marketable now. This does not imply that you will go downhill, but simply that as you get older and more experienced, you will have higher demands for salary and resources. If you wish to leave your institution when you have achieved the rank of associate professor (or if your institution awards you the rank of associate professor but denies you tenure), you will be on the job market at the associate rank, which at some institutions carries obligatory tenure. In some cases, the first contract period before the tenure decision is short and it will be difficult for you to have really shown your department what you can accomplish in research. Therefore, it's in your interest to try to make sure that your first academic job is at an institution where you think that you would like to stay

and work your hardest for at least five or six years.

JOBS IN INDUSTRY

- *Is Industry a Good Fit for You?* Unless you absolutely cannot imagine a life without academic teaching, a position in industry can be very appealing. Note that industry positions can involve teaching, but simply to a different audience: instead of lecturing in an undergraduate- or graduate-level course at a university, you may find yourself teaching colleagues various techniques or theories.

Benefits of an industry career can include resources for equipment, travel and technicians' salaries. This means that you have a better chance of attracting and keeping experienced first-rate technical people. Salaries are generally higher and overall support facilities are frequently better and more up-to-date than in academic institutions. Increasingly, presentations at major meetings and articles in major journals are authored or co-authored by people working in industry. This reflects a growing recognition of the importance of first-rate research in industry.

Another advantage to a career in industry is that it allows you to use your strengths and concentrate on them. Most companies now have tracks. If your strength is technical and you like benchwork, you can take a scientific track. If you are good at management and want to be involved in strategic planning and administration, you can take a management track. Either of these tracks offers the opportunity to advance in pay and position, according to your preference and strengths.

“Industry” refers to an extremely diverse group of opportunities ranging from giant chemical and pharmaceutical companies to very small (20 to 60 employees) start-up companies. The experience of actually working in these places is very different. You need to research the feel of a place and think critically about how you would fit into that particular environment, because these microenvironments have a more isolated feeling than an academic institution. If you are a woman, you should keep in mind that some industries are still behind academia in providing equal opportunities for women, while others, especially newer industries with younger leadership, can be more ad-

vanced. Overt discrimination is illegal, but in some sectors of industry you may need to be more aggressive about “reminding” people of your existence when job openings or promotion time come around.

You must think through carefully what you can bring to a company that it needs. Do you like to work on a number of different projects at once? Do you get along well with and enjoy working on teams? Do you like practical problems? Do you like to be part of a project that is moving very fast in a competitive environment? Do you get satisfaction out of seeing your work put to practical, immediate use? Would you enjoy learning about where your work might lead, e.g., patent writing or designing clinical trials? Would you like to combine any of the above with working on the long-range basic research questions? Are you willing to change fields if the company’s objectives change? If so, you might enjoy working in industry.

On the other hand, you will have less control over what you work on and who you work with than you would have as the head of a typical academic

ternatively or in addition, many companies have web pages which not only list job openings, but can give you good insight into the company's research and other activities. Another venue to learn about companies is at the posters presented from industry researchers at conferences (also look for publications by people at the company in the literature). Scientific meetings are good places to make contacts as well as find out which companies serve your interest areas.

Next, get on the phone. Speak with anyone you can think of who might have a contact at a company of interest to you. Even if it's only a friend of a friend of a friend, call that person. Then, use the connection to contact someone at the company. If the company contact seems willing to chat, ask her or him if they would be willing to do a short informational interview in person. This requires no commitment on their part, but gives you a foot in the door and can help you assess the environment of the company. If the person you contact is unwilling or too busy to provide the interview, ask if they can suggest someone else at the company you might contact, perhaps someone whose interests are more

aligned with your own. When you visit the company, bring several copies of your CV, whether the company has an advertised opening or not. Make sure you get your CV into the hands of a scientist there, or even better, into the hands of a scientist who is hiring. Have a well-researched list of questions to ask about what it's like to work at that particular company. If nothing else, this type of search strategy will help you focus on the type of company you prefer. That's important since most academically trained scientists have never before stepped inside the hallowed halls of a biotech firm.

Keep following up on your contacts. Ask each person whom you call for the names of other people they know in the industry who might talk to you, and call them. Ask those people if you can send them your CV, and then ask each of them for more names, etc. Soon, you'll have an extensive network of contacts such that, when a job does come along, one of them might remember you and dig up your CV from their files. It's always better if you can meet people in person, through an informational interview, so that they have a sense of who you are and can connect a face to a name.

■ *The Interview* When your strategy pays off and you are invited to interview, it is important to be as knowledgeable and as enthusiastic as you can honestly be about working in that company. Chances are that the people interviewing you are going to be depending on you (if hired) to do your part to see that the company survives (if it is a small company) or, at the very least, for intellectual stimulation since much confidential work cannot be discussed outside the company. All the points discussed in the context of academia about giving a seminar and the interview apply here, too. If you are being hired as a scientist, they are interested in your science. Many companies will consider only the best scientists; the days of “second-rate” science in companies are over, and you will only insult your interviewers by assuming that they ever existed. Find out as much as you can about the science done in the company. Ask for a list of publications from the department or company. When visiting, ask people what they are doing and what their major interests are (these may or may not be the same). In the interview, you need to convey why the company would benefit from hiring you: what

skills and expertise you bring to the company that would make you particularly valuable. Make your seminar relevant to the people with whom you will be interviewing.

Find out what you will be expected to do, how much time will be allowed to follow your own interests, what the publication policy is, how much space you will get, where your lab will be, and how many people will be working for you and at what level. Find out if the company takes post-docs and how to get one in your lab. Can you have a joint appointment with a local university and, if so, do you want it? This is extra work since you might be asked to teach, but it may make an eventual move back to academia easier, if that becomes necessary or desirable. Find out the equipment budget and what shared equipment is available, and have a list available of what you need to do your work. Learn about the reporting structure (the “org chart”) and as much as you can about the person to whom you will be reporting. Ask what other people in the area/department do. This can vary from predominantly basic research to running a service lab (e.g.,

making monoclonal antibodies for other people). In any case, assume that you will be spending a significant proportion of your time on things of interest to the company. The more you can see what is needed before others do and voluntarily take it on, the more control you will have over how you spend your time and the more you will be seen as valuable. In comparison with academia, you will not have to spend time writing grant proposals and teaching (unless you become associated with a university). However, you will be required to write many reports and attend many company meetings. How extensive these duties will be depends on company policy.

Find out the management level of the position for which you are interviewing. This is especially important in industry since some companies are creative in assigning job names, and there is no way of knowing without further information whether a “staff scientist” is equivalent to a post-doc or a vice president. How many research assistants will you be able to hire right away? Will you be able to hire more after a period of time? It is imperative to align your expectations

with the company’s; this is a common area of misunderstanding. If you are going to be hired as a “staff scientist,” what are the duties and reporting structure, and how many support staff do other staff scientists have?

Try to find out the median and range of salaries for your position (however, keep in mind that HR departments are not always forthcoming with this information), the details of the benefits offered and the relocation program, including possible interest-free or forgivable loans to help you buy a house.



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It is a good idea to ask if there is flexibility in work structure for people

who have families; for example, will you be able to leave everyday at 5:00 to pick up your children if you come in early, or is the culture such that “family time” is frowned upon?

The benefits and hiring package may include a stock option or another stock program. If you do not follow the market and especially if it is a small company, you might want to ask the opinion of a stock broker, investment banker, analyst, or at least a knowledgeable colleague. In some cases, stock options may turn out to be worth far more than your salary; in others, they are worthless. You should particularly scrutinize stock-based pension plans. As with any investment, the bigger and more established companies offer more security, less flexibility, and less potential for a big gain either financially or through fast promotion than do rapidly growing companies. It is always inadvisable for your whole pension plan, or even a majority of it, to depend on the value of a single equity, no matter how stable or promising it may seem.

- *Negotiating the Offer* Once you are offered a position of interest, negotiate everything. In companies this is the norm. One can even come back

with counter offers several times. Everything from moving expenses to salary to the number of people to be hired in your lab should be discussed. These negotiations are almost always handled through an HR representative, not through the hiring manager. Some things are less flexible than others (stock is regulated by the SEC) but you should get a clear idea of what these are. There is frequently no contract, but you can and should have everything in writing as with any other job. When you interview you might ask some trusted people in the company, discreetly, if they were given what they had been promised.

When deciding whether to accept the offer, pay attention to response time. You shouldn't feel pressured to make a snap decision; however, unlike academic positions, industry positions are usually filled in a short period of time, typically weeks to no more than two months. Therefore, you should be prepared to make a decision fairly rapidly; it helps to hold multiple offers for jobs simultaneously to optimize decision-making.

Many companies will invite you to a “house-hunting” visit after you

have accepted a job, or pay for an apartment while you find a place to live. Once the job is accepted, some companies will want you to show up the next week. Try to agree to a reasonable and mutually agreeable time for arrival. Finish up as much paper writing and other obligations as you can before you arrive. You should hit the ground running in your new job and may well find a stack of deadlines waiting for you when you arrive.

It may be advisable to take a short vacation before you start your job. Make sure to negotiate your start date to allow for it, which is much easier than finding time after you've started. You will need a vacation to get through the very hectic first year or two, whether you have accepted a job in academia or industry.

WHEN YOUR PRIMARY MISSION IS TEACHING

■ *Prepare for a Teaching Career While You are in Graduate School*

If you think you want to teach at a four-year college, a liberal arts college, a community college, or in high school, get as much teaching experience as you can while you are in

graduate school. Many graduate programs offer an education minor. Take advantage of the courses offered through this option or in the institution's education department. If your school offers courses in college teaching methods, take them. Attend teaching workshops, even short ones of a couple of hours to a couple of days. They will provide you with many teaching tools to add to your repertoire, and will provide an opportunity to discuss your teaching style with peers and professionals. Talk to and observe good teachers who have teaching styles that you might like to emulate. Ask them why they teach, how they prepare lectures and classroom activities, and where they get ideas for new methods. Seek supervised teaching internships in which you prepare and implement lectures, classroom activities, homework assignments, and exams for an entire course while the professor observes and critiques you. Internships also give you a chance to try out different teaching methods, and develop a teaching style of your own. Candidates who can demonstrate that they can handle the pressures of lecture preparation, grading, and student contact for an entire semester will be more attractive than those whose only

experience is a few guest lectures. Most small colleges expect each faculty member to teach at least three courses per semester. A teaching internship in graduate school will give you a good sense of the time commitment required for each course and whether you like interacting with undergraduate students. When you apply for a teaching job, organize your CV so that your teaching experiences and the courses and workshops you attended are prominently placed.

TEACHING PHILOSOPHY

- T. Angelo and K. P. Cross, *The Teaching Goals Inventory*, at www.uiowa.edu/~centeach/tgi/.

■ *A Teaching Philosophy* One of the most important components of a successful teaching job application is a statement of your teaching philosophy. Developing a teaching philosophy requires careful self-reflection on why you are choosing a teaching career. The happiest and most successful teachers align their teaching

methods and style with their rationale for teaching.

Once you have reflected on your reasons for teaching and understand how your teaching style mirrors them, write a teaching philosophy that includes why you teach, how you teach, how you assess students, what responsibilities you expect students to accept, what thinking level you expect students to achieve and how your teaching methods help them to achieve that level, and how you plan to continue to improve your teaching. The statement should be no more than one-and-a-half pages; preferably a page or less. Have colleagues and mentors whose teaching style you admire critique your philosophy before sending it out with an application. A sound teaching philosophy that is rooted in solid education research will guarantee that your application stands out from among many applicants. (*See sample Teaching Philosophy, page 53.*)

■ *A Statement of Research Interests* Some small colleges will expect you to maintain a research program that involves undergraduate students. If you earned your PhD at a research-inten-

- B.G. Davis, *Tools for Teaching*, Jossey-Bass Publishers, 1993.
- P.G. Cottell, Jr. and B.J. Millis, *Cooperative Learning for Higher Education Faculty*, Oryx Press. 1998.
- T. A. Angelo and K.P. Cross, *Classroom Assessment Techniques: A Handbook for College Teachers*, Jossey-Bass Publishers, 1994.
- P. M. King and K. S. Kitchener, *Developing Reflective Judgment: Understanding and Promoting Intellectual Growth and Critical Thinking in Adolescents and Adults*, Jossey-Bass Publishers, 1994.

sive university, you will need to think carefully about how to scale down your research goals realistically to fit the lesser time and resources you have available at the teaching institution.

Undergraduate students only have a few hours per week to do research, and they need a considerable amount of training and supervision. Their progress will be slower than that of a graduate student or post-doctoral fellow with a fulltime commitment to research. In addition, teaching responsibilities will take a considerable amount of your time, so it is unrealistic to expect the same level of research productivity that you achieved as a graduate student. Undergraduate research experience is an essential part of a scientist's education because it requires a high-level thinking experience, gives the students a taste of how researchers think and work, and exposes them to the joy of discovery. In addition, most graduate programs, including the medical and dental professional programs, require research experience from their applicants. You can take advantage of this requirement to recruit good students into your lab, and can expect them to produce publication-quality work, even with a small time commitment.

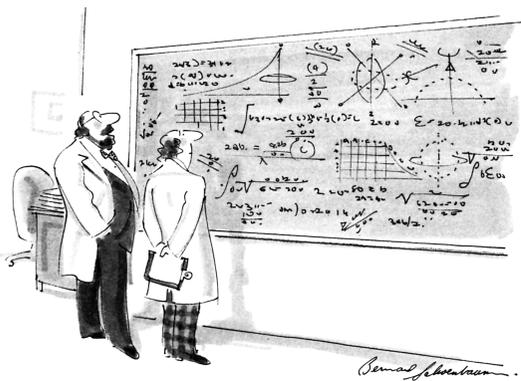
- *The Teaching Seminar* Your on-campus interview is likely to include a teaching seminar in addition to your research seminar. Some schools select

the topic, while others allow you to choose the topic. The length of the seminar can vary from 15 minutes to guest lecturing in a 50-minute class. In any case, organize your presentation to include the most appropriate methods and activities with which you are most comfortable, and that you have tested in your classroom. Showcase your style, and be sure that it is consistent with the teaching philosophy that you included with the application.

and if you would be willing to develop and/or teach a class that includes students at a remote location. What kind of technology do you use in your classroom and why? What courses do you think are most appropriate for the web and why? To prepare for these questions, you will have to read the current literature and/or discuss the pros and cons with a mentor that has experience. Many small colleges use distance learning or web courses to increase their enrollment without adding proportionally more faculty positions.

■ *Teaching Questions You Should Ask*

If teaching is to be your primary focus, there are several things a school can do to make your job easier. Find out if the school has a Center for Teaching and Learning with a director who is experienced with faculty development. Centers are invaluable resources for new teaching tools, self- and student-assessment tools, and non-judgmental problem solving. Find out if the department has a teaching philosophy and, if so, whether it is compatible with yours. Neither you nor your colleagues will be happy if your teaching philosophies clash. Ask about teaching loads,



"Oh, if only it were so simple."

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■ *Web-based Learning* You need to be prepared for questions about current trends in college education, even if you have not had experience with them. For example, you may be asked your opinion of distance learning,

how they are distributed among the faculty, and how much flexibility you will have in the courses you will be expected to teach. For example, will you teach the large introductory course, or will this course rotate among faculty members every few years so that you can develop a specialty course in the off-years? Flexibility has the advantage of preventing boredom with teaching the same courses every year, but the

disadvantage of potentially time-consuming preparation for a new course. Find out how much help you will have to prepare for laboratories. Many small schools do not have a graduate program to provide teaching assistants, but there may be a staff member to help with ordering supplies, setting up equipment, preparing solutions, media, etc. Doing these chores yourself can take a considerable amount of time.

Sample CV

YOUR NAME

PERSONAL INFORMATION

Address

E-mail address

Telephone

Fax

EDUCATION

BS, Honors Program in Biology, Your College, 1991

MS, Your Major, Your University, 1993

PhD, Department of XX, Your University, 1998, Thesis title, Thesis advisor,
Short description

Postdoctoral fellow, Department of XX, Your University, 1998–present,
Project title, Advisor, Short description

HONORS AND FELLOWSHIPS

National Science Foundation Predoctoral Fellowship, 1994–1998

National Institutes of Health Postdoctoral Fellowship, 2000–present

Sigma Xi, 2000

TEACHING EXPERIENCE

Teaching Assistant, Introductory Biology, Your College, 1990–1991:
prepared materials for lab and taught one section each semester.

Lecturer, Physical Biochemistry, Your University, 1992–1993: presented
several lectures on structural determination for graduate students.

Lecturer, Molecular Biology, Your University, 1998–2000: presented four
lectures per semester on PCR cloning for undergraduate students.

GRANTS AND RESEARCH SUPPORT

National Institutes of Health GM-0000000 #100,000 1/98 – 1/00,
Co-Principal Investigator, “Angels on Pins.”

PROFESSIONAL SOCIETIES

The American Society for Cell Biology

The American Association for the Advancement of Science

INVITED LECTURES

State University, Department of Cell Biology, 2000

State College, Department of Biology, 2001

RESEARCH AND PUBLICATIONS

A major puzzle of biology has been determining the number of angels that can dance on the head of a pin. Early anatomical studies indicated that angels exist, but the question of how many can dance has remained unanswered. My first introduction to this field involved a determination of the shoe size of angels. We reasoned that no more angels can be packed onto the head of a pin than the closest packing array of angels' shoes.

Your Name, et al, 1990. Angels Wear Size AAA Shoes. *Science* **297**: 5 – 7.

For my master's thesis, I designed a technique for purification of angel shoes, and discovered that the shoes will easily detach from angels in high salt buffer.

Your name, et al, 1993. Purification of Angel Shoes. *J. Biochem.* **20**: 123 – 133.

We subsequently accomplished reassembly of shoes and angels in the presence of an extract from angel-free pins. In the absence of pin, extracted angels and shoes formed a regular crystal lattice, which we characterized using X-ray diffraction. In the presence of pin extract, only a limited number of angels and shoes reassembled, and each angel was accompanied by two shoes. Subsequent scanning electron microscopic studies showed that each angel was in fact wearing a pair of shoes in the reconstituted system.

Your name, et al, 1995. Reassembled Angels. *Mol. Biol. Cell* **6**: 11 – 21.

Your name, et al, 1996. Angels Wear Two Shoes. *Mol. Biol. Cell* **7**: 22 – 32.

Your name, et al, 1997. X-ray Diffraction of Angels Wearing and Associated with Shoes. *J. Cell Biol.* **100**: 1 – 19.

The question of whether angels can dance has been the subject of my postdoctoral

studies. We found that the metal composition of the pin is the determining factor in dance behavior. Only pins that conduct electricity have dancing angels. To study this process kinetically, we took advantage of the propensity of angels for losing their shoes while dancing on an electrically activated pin. Dance behavior under these *in vitro* conditions mimics normal behavior, although more angels dance than in non-electrically stimulated situations.

Your name, et al, 1999. Angels Get a Charge from Dancing. *Nature* **260**: 25 – 29.

A fine structural map of the head of a pin after an angel dance revealed the presence of a set of box-like demarcations. The presence of this “dance floor” develops as a function of time and angel concentration. We detected a non-dancing angel mutant that spontaneously arose in our laboratory stocks by its inability to lose its shoes. The angel and all parthenogenetic progeny were both unable to dance and unable to design a dance floor.

Your name, et al, 2000. Angels Build a Disco. *Mol. Biol. Cell* **11**: 1 – 30.

Your name, et al, 2001. Non-Dancing Angels Fail to Lose Shoes or Design Dance Floors. *Cell* **25**: 30 – 41.

Currently, I am determining the relationship among shoe structure, shoe loss, and the ability to lay down a dance floor. Our preliminary evidence indicates that non-dancing angels wear a smaller shoe size than dancing angels, and may be restricted from dancing by foot problems.

My future research goals are to understand the relationship between structure and function of excitable units such as angels.

PERSONAL INTERESTS

Reading science fiction

Mountain biking

Rock climbing

Sample Teaching Philosophy

TEACHING is a social activity. The best part of being a teacher is meeting and interacting with students, and getting to know them and their life goals. Unlike other social endeavors, though, teaching allows the teacher to help students achieve their career goals by training them to think like biologists, and by providing references.

In the field of biology, it is important for students to know basic scientific facts, but also to be able to apply those facts to new situations, and to evaluate the mass of new information that is released to the general public every day. These skills are critically important for those students planning careers in the health-care professions such as medicine and dentistry. However, it is also important for biologists in non-health related fields to learn these skills so that they can make informed decisions about their own health or about their particular work-related problems. In my classes, I strive to teach the basic language and principles of biology, how to apply that basic knowledge to many situa-

tions, and the critical thinking processes that biologists use to evaluate new information.

I use several different teaching methods to achieve my learning goals, but the overarching theme in my classroom is active learning. For example, during lecture, students are involved as often as possible by soliciting their input, opinions, and questions, or to determine their level of prior knowledge. Pair-share activities are useful for having the students teach each other how to apply newly presented biology facts to problems or to discuss opinions with a peer prior to sharing with the entire class. Small group activities (4-5 students) are used to quickly cover basic information from the textbook and apply it to important concepts, to discover the connections between topics, or to discuss homework assignments. Closure on the small group activities is achieved by bringing the class back together to discuss common problems or to share solutions. Research shows that active learning techniques enhance learning

and retention because they allow the students to encounter the material in several forms, such as reading the text, listening to and taking notes on a lecture, and discussing with fellow students. More importantly, these methods provide the opportunity for students to teach each other, the most effective way to learn. Active learning methods also provide the opportunity to interact with students individually, which improves learning.

It is critical that exams be written to reflect the level of difficulty and types of thinking that the students deal with in class or in homework assignments. Students can expect exams to consist of an appropriate mix of recall, application, synthesis, and evaluation questions. For the problem solving and evaluation questions, the students are graded on the process of reaching a well-supported answer, rather than the answer itself.

Student learning is improved when responsibilities are clearly defined. It is important for a teacher to resist their immediate instinct to a student in distress by taking on their responsibilities, which does not aid in their personal or educational development. It is more helpful to work with the student to establish a reasonable plan to enable them to meet their responsibilities.

At the end of my courses, students will have a solid knowledge of biology, and be able to use that knowledge to solve problems. They will also understand the process by which scientists discover new information so that they can think like scientists and evaluate new information scientifically. These goals are achievable for all students who come to class regularly and participate actively.

