

## **"The road to tenure"**

by Chris Wylie

### **Introduction**

You are standing in your own lab! All the negotiations, decisions, packing up, farewells, horrors of transporting all those mice (frogs, flies, worms, fish), welcoming parties etc, are over. You have found a house (apartment, condo, mobile home, houseboat), and you are actually standing in your own lab.

With a bit of luck it will be empty. More likely it will contain the detritus of the previous occupant. Bits of equipment from a bygone age, with thermionic valves and actual mechanical switches on the front, posters from conferences impossibly long ago, or reprints of papers written by people you suspect have been dead for many years, will have to be disposed of. Pile it all in the corridor, go and buy some paint, and do the place up. Do not wait for "facilities management" to do this. Do not listen to low-level administrators who say that you cannot clear it out, or put it in the corridor. Your tenure clock has started ticking. Get rid of it.

Tenure clock? But tenure is still an impossible six to seven years away. Yes, but this is exactly the time to start planning for that moment when you submit your tenure dossier. This is the time to be putting together a timetable for the next five years. By then you will need to have funding for your research, have demonstrated effectiveness at teaching, have published at least five full-length papers in mainstream or premier journals, showed that you can carry your share of departmental administration, and be liked, or minimally, respected, by your faculty colleagues. When you put it together like this, it seems a tall order for a five-year period. However, it can be done, and is done by a majority of young faculty. So organize your timetable, and make a start. Here are some words of advice, in no particular order

### **1) Your first priority is your own research**

In a premier research department or institute, everything else is subordinate to this. Collaborative research is fun, and makes things go faster. However, your tenure decision, whilst enhanced by good collaborations, is based upon your own program of research.

### **2) Mentorship.**

Right at the beginning, identify a group of senior or middle ranking faculty who can act as mentors. Usually, your department chair will do this for you. If it doesn't happen, don't be afraid to take matters into your own hands. Identify faculty members who seem to be successful in getting papers published and grants funded, and ask them to help you.

### **3) Lab personnel:**

(i) Hire a technician. Do this right away. Your technicians are your new hands. Take time to train them. Give them realistic goals, and talk to them every single day about where they are with various procedures. An hour a day doing this saves a huge amount of time repeating experiments because you didn't catch mistakes in time.

(ii) Should you hire a graduate student? Think carefully about this. There both pro's and con's. On the pro's side, there is a feeling that a team is building up, and you are not alone. If the graduate student is good, it expands what you are able to do, and improves the intellectual environment of your lab. And it's someone to talk to, and bounce ideas off. However, the con's side is equally impressive. It is often forgotten that graduate students are there to be taught, and are not already trained to carry out your research program for you. In most cases, yes most cases, they are net losses in the results game, because, it can take a long time for graduate students to reach the level at which they can make a net positive contribution to your research program. Some never do! In addition, unless they are funded by a training program, they use up your start-up package. If you do want to take a graduate student, check on the availability of training grants to fund their stipends. A graduate student can require more than three years to finish his/her project and graduate. Your start-up package is usually only for three years.

(iii) Should you hire a postdoc? Yes, if you can find one, and if he/she is good. Do not be flattered by the fact that someone actually wants to come and work with you. Be selective. It is better to work on your own than with someone who isn't very good. One good way to find a postdoc, since graduating students will probably not be beating at the door, is to identify more established colleagues who either have surplus applicants, or who are trying to recruit postdocs who need to find positions for their spouses. email your faculty colleagues about this.

(iv) Firing lab personnel. Nothing is harder to do. Your lab rapidly becomes more like a family to you than a traditional working group, and it becomes

progressively harder to do traditional things like discipline people and terminate their employment. However, this can be a costly attitude, as it is exactly what will happen to you if things don't work out during your untenured period. Not everyone you hire, however careful you are to take references (which you will soon learn to take with a heavy pinch of salt) will do a good job, and some will do positive harm. If you are unlucky in this respect, you will discover the "dominant negative" personality. There are three things to remember. First, honesty is always the best policy in a working relationship. If someone's work or behavior is at fault, you must tell them. Second, all institutions have a probationary period of employment for lab staff. If problems arise during this period, don't take any chances. Three, there will be an institutional policy for this sort of thing. Involve your business administrator/personnel officer/department chair right from the beginning. They will be more experienced than you, and if they are good, will take the problem off your hands once you provide evidence that the lab member is not doing their job properly, or misbehaving in a way that disrupts others in the lab.

Whatever you do, do not be tempted to fill up your lab as fast as possible with warm bodies. Every new person needs training, and will test your capacity for personnel management to the limits. And this is a time when you are trying finish the preliminary experiments for your first grant, and get your first independent paper published.

#### **4) Recording stuff in an organized way.**

Start right at the beginning. Set up databases using commercial software for freezer stocks, clones, antibodies, chemicals, procedures, and results. Don't wait until the job is too big, and don't pile stuff randomly into fridges and freezers hoping you will remember later where everything is. You won't. As people come into your lab, make sure they are trained to use the software, and that they fill in the databases with details of every reagent they either bring in or make. Refuse to write letters of recommendation for anyone whose freezer stocks and database records are not up to date. Nothing is worse than finding out that your graduate student (postdoc, technician) who is now a missionary in Angola, did not record the whereabouts of all those clones you said you were making in your grant application, or what vector they are in.

#### **4) Getting the necessary approvals.**

(i) Go and find the head of the vivarium if your research is on animal models. Find out what you need to do to get a license to do this, and any modifications to your lab that are necessary. Check the animal costs, particularly if you have the

choice of barrier or non-barrier facilities for mice, think hard about what kinds of experiment you will do, and which are best and most economical for you.

(ii) Go and find the head of radiation safety, if you intend to use radioactivity. Getting licenses for these things can take surprisingly long, and if you set them in motion as soon as you arrive, it will save time.

(iv) Similarly, find out if you need a license for recombinant DNA research, and for use of toxic chemicals/hazardous materials, and set these in motion. Your institution should have a Biosafety Committee, which handles these things. More forms to fill in. Keep copies of everything, so you can refer back to them.

**5) Ordering.** Find out what ordering system your department uses, and particularly how records are kept of your lab expenditure. If nobody in your central office does this, set up a database for expenditure. It is extremely difficult to keep track of expenditure. It is essential that you have a record, because if someone in your central office makes a mistake, and charges your expenditure to someone else's account, or vice versa, it gets impossible to unravel if you don't have an independent record.

**6) Equipment.** Go round and make a list of all the common equipment you have access to. Find out who looks after these items, and write down their home and lab telephone numbers. Inevitably you will find yourself locked out of the phosphorimager or confocal room after hours because nobody told you where the key is.

**7) Grants** Go and find the grants officer (if there is one). This person should be able to tell you if there are local sources of funding to supplement your start-up funds until you get a major grant. Get deadlines and instructions for small grants that people in your department have successfully competed for previously. Talk to these successful applicants about how they did it.

### **Applying for an NIH grant.**

Nothing evokes terror like the first application for major funding. However friendly and accessible NIH program staff are, and however user-friendly the forms become, nothing takes away the pain of this most exposing process of peer-review. There is simply nowhere to hide when your grant goes in, so just get on with it, and maximise your chances by listening to criticism of your colleagues, and making sure you follow the instructions.

(i) Talk to grants administrators at the different NIH institutes that seem to best cover your proposed project. There is quite a lot of overlap between institutes, so

go to the web sites, identify grants administrators, call them up, explain that you are a first time applicant, and you will probably get some good advice. Keep this dialogue going. Grants administrators can be extremely helpful in helping to select a study section, and in giving you feedback when your grant has been reviewed by the study section. They will often point out which criticisms are particularly important, since they attend the study section meetings and listen to the discussion of your grant. It is obvious that the better they remember you, the more likely they are to remember details of the discussion.

(ii) Talk to your own business administrator, or department chair, about the nuts and bolts of the money you are applying for. If you are expected to put a certain percentage of your salary on your first grant, you need to know about this while you are still planning your budget. Some institutions want you to put a percentage of central resources (dish room costs, for example) on your grant. Remember, your institution will have a person or office that checks the grants before they go on to NIH, so allow enough time for this, and find out about the figures before you start. Sometimes, if you are lucky, there will be an efficient grant administrator in your department who will do the figures for you. You just tell them what things you want money for, and they will do the paperwork for you. Other institutions have electronic applications which will work out the figures for you. If you have neither of these, then you need to find out the salaries of technicians, graduate students, and postdocs, as well as the amount of fringe benefits, so you can fill in the figures yourself.

(iii) Before you start writing, think about the process by which grants get judged. Your grant will go to a "study section"; a group of working scientists who all work in one discipline, or closely related disciplines. Study sections are not parts of, and are independent of, the funding institutes. Having institutes review their own grant applications was felt to be a potential source of cronyism, and so the study sections are now run by a completely independent institute, the Center for Scientific Review ([www.csr.nih.gov](http://www.csr.nih.gov)). The list of study sections is available on the web page of this institute, as are the rosters for each study section. When you send in your grant to the CSR, you can indicate which institute (or institutes; you can ask for dual assignment) you would like it assigned to, and which study section you would like to handle it. You will have worked this out by discussion with grants administrators at the different institutes. So you can influence this process, and the NIH will usually oblige you. Once again, it is wise to take advice from your colleagues, and from the grants managers at NIH.

Your grant will be read by three members of the study section. Two of them will produce a written report, which will be made available to you. Sometimes the third reviewer (or reader) will make a brief written report as well. These reports are written before the study section meets, and often modified after discussion at

the meeting. Each grant is presented orally to the study section members by the two reviewers, who provide a description, a critique, and suggested score. The reader then adds comments. All members of the study section then write a score down for your grant, which is collected up and averaged. Generally, each study section member gets 10-15 grants to review for each meeting.

Based on this, your task is obvious. You have to convince the three people who read your grant that they should put it in the top 20% of their pile (i.e. the top 2-3 grants in the stack of 10-15 that each member generally gets to read). Each study section member knows that only the top 2-3 of their grants are likely to get funded, so it is natural that they will make the rest of the meeting aware that these are the top 2-3. So, what factors influence study section members to put grants high on their score sheet?

- a good track record of publications. They have to be convinced that you are capable of both carrying out the research, but also of making it known to the rest of the scientific community. It is absolutely essential that you publish all your work, and present your work regularly at meetings.

- An interesting problem, something that catches their attention.

- A clear presentation style. 10-15 grants is a lot of work. It can take two weeks to read them carefully. The clearer and more succinct you can be the better. Do not be deceived into thinking that the more you write, the clearer it is to the reviewer. For them, it is just more work.

- Clear hypotheses. Make sure that you present your work as a series of testable hypotheses. "I am going to look at the genes expressed....." is not good. "My hypothesis is that the following genes will be expressed after....." is better.

- Your experiments must test the stated hypotheses. List the potential outcomes of each experiment, and how these will prove or disprove your hypothesis.

- An achievable plan. Don't be tempted to keep adding new aims to make a more complete story. It doesn't work that way. Study section members have a good idea of what can be achieved by a starting faculty member, and the most common critique of first-time grants is "over-ambitious". Learn from this.

- Be realistic. Some experiments will give equivocal answers, or may not work. Try to anticipate this criticism by thinking of what you would do if an experimental approach simply doesn't work. Think about the hypothesis that was to be tested in that experimental series and put forward alternative approaches. Another very common criticism is "lack of alternative strategies".

(iv) You have now thought about the process. How does this translate into what you write? A grant is organized into four sections: Specific aims, Background and significance, Preliminary data, and Research design and methods. Each of these sections should contain different material, but the whole should make a single story.

- Specific aims. This is the most difficult bit. It is a single page, which should contain, crystallized into a couple of paragraphs, a summary of the grant, and a list of your actual aims and objectives. Do not get into details, briefly state the general research problem, and your part of it. Be succinct in each aim. Don't make the aims too interdependent. If your first aim should fail, and all subsequent aims are dependent upon it. You will be in trouble.

- Background and significance. Do not review your own work here, unless you are the only person, or a major contributor, in the field. What the study section needs to know here is what previous work led to your ideas, how your aims fit into the general area of research, and the general importance of the work. Make sure all the specific aims are covered by background material. It is often helpful to divide this section into headings, each of which covers one of the specific aims. This is even more important in the next two sections (see below).

- Preliminary data. This is where you present your own research, both published and unpublished. Remember that each section of preliminary data should be preliminary to one of the specific aims. It is good grantsmanship to keep the same headings for the specific aims and preliminary data. If that is not possible, indicate for each bit of preliminary data presented, which specific aim it is preliminary to.

- Research design and methods. Do not just reel off a series of experiments that you think are good ideas. This section should have the same headings as the specific aims. Each experiment should indicate how it will test a hypothesis in the specific aims, and how it is a natural continuation of the work presented in the preliminary data section. At this point in the grant, the reviewer should feel familiar with what you are doing, not constantly having to go back to find out why you are proposing a particular experiment, or to remind him/herself what bit of preliminary data led to this planned experiment. By presenting each section with the same headings, this can be avoided.

Your mentorship committee should be used mercilessly to help you with these goals. Present them with the completed grant several weeks before the submission deadline, so they can provide feedback. Remember, the NIH schedule for judging grants is extremely long. An application for the October

deadline will not be discussed at a study section until February, and you will not get written comments back until several weeks after the study section. So the next deadline you can realistically make for a revised application is the following July, ten months later. And if the reviewers call for additional preliminary data that you had not anticipated, November is more realistic. So you can waste a whole year by not getting your grant pre-reviewed by colleagues who know something about it, and preferably have been on a study section.

(v) Maximize your chances by alternative strategies. You may think that once your grant goes off in the mail, it's all in the lap of the gods. Possibly, but you should not give up at this stage. Here are some things to try. First, find out which study section your grant has gone to. Then identify all the people on that study section who could possibly be reviewers of your grant. When they are wading through their pile of grants for study section, your chances are better if they are already familiar with your work. How can this be achieved? Two ways. First, apply for platform presentations at meetings where study section members are speakers. If you end up presenting posters instead, go and find them and bring them to your poster. Don't be shy. Nobody ever failed to get a grant because they were too pushy! Second, ask for study section members to be speakers in your department seminar series. Make sure you are on their schedules, and that you have a really good presentation ready for your half-hour with them. Have a neat, bound folder of data, or a power-point show which briefly summarizes your research. Make sure you have full-page prints of data, in the order you are presenting it. People remember the clearest stories with the best data, so don't overcomplicate it.

Remember, the people to whom you present your data at meetings, or who are visiting seminar speakers, are also the editors of journals, reviewers for journals, and study section members.

## **8) A suggested timetable.**

### **The first six months.**

- Write up any outstanding work from your postdoctoral period and get it published. It is essential to do this to avoid gaps in your publications list.
- Hire a technician
- Set up your equipment
- Work out the preliminary experiments you need for your grant, and get started.

- Reserve a slot in the departmental seminar series to present your research, and present it as a grant application. All feedback is useful at this point, and faculty colleagues will be a captive audience.
- Read exhaustively about your proposed research. There is much truth in the old saying that an hour in the library can save a month in the lab.
- Identify some faculty mentors
- Draft out a grant proposal and circulate it to your mentorship committee. If you cannot identify people for this, don't be afraid to call senior faculty at other institutions. Everyone understands the problem of getting feedback on your first grant, and you should find people who are prepared to look at it, and to offer helpful suggestions.

### **The second six months**

- Hire a second technician. By now, your first one should have the lab functional, have an inventory of stocks, have mastered the ordering system, and the equipment. Start training your first technician in the research techniques you need done, and have the first tech teach the second one the routine stuff. It is important to set up a pyramid structure in the lab right from the start, so that you don't personally have to teach everything to everybody.
- Finish your grant and get it submitted.
- Write up your work. You have to set up a strict regime in your lab whereby you publish at least one paper per year. Study sections and promotion committees notice gaps in your publication record. If your goal is to produce five major research papers for your tenure package, you need to produce one every year. It is very bad strategy to assume you are going to produce five in your last year.
- You should get a formal faculty evaluation each year, with written comments, from your department chair. If there is no such arrangement, ask for it. Benchmarks for success need to be clearly delimited at this meeting.

### **The third six months**

- Think about your grant application. If you submitted in October, you have a precious few months to improve it further. Sounds impossible? It's not. The CSR will accept updates to applications until a few weeks before the study section meets (check how many weeks, so you don't miss the deadline). There is a special skill to this. You want to aim to send in an update that contains, within 1-2 pages, something that significantly improves your application. Perhaps a preliminary experiment that wasn't ready for the original deadline, or better pictures that strengthen one of the preliminary experiments.

- Organize seminars outside your home institution. The importance of outside seminars cannot be overemphasized when it comes to promotion and tenure. Starting faculty members tend to think they have no connections that will enable them to be invited to give talks. This isn't so. You should contact former graduate or postdoc colleagues, former research mentors, and people you meet at symposia and simply ask them to invite you to give a talk. Try to time such requests for when your papers come out. Here is a suggestion for such an unsolicited overture, based on the fact that you have identified someone whose views you respect (a euphemism for someone who is likely to be approached by your tenure committee for a recommendation), and summoned up the nerve to call him/her.

you: "Hi Dr. X. It's.....(supply your name at this point if you can still speak). I am a new faculty member at ....., and I work on ....., and I want to ask a favor of you. You are a major figure in this field, and I want to ask a favor of you.

Dr. X: Hi. What can I do for you?

you: I will be visiting .... (the bay area, for example) during the Fall, and I would love the opportunity to visit you, and talk about ....., My paper has just come out in ....., and I would be happy to email you a pdf, or send you a reprint.

Dr. X: Sure. Happy to see you. When did you say? (a pathetic gambit that you easily counter).

you: When will you be in town over the September to November period? Maybe there would be an opportunity to give an informal talk to your research group?

Dr. X: That would be fun. Let me know a date, and I will check that I am here.

you: Suggest a couple of dates, then: "is there anyone else in the bay area you feel I could contact? It would be a great opportunity for me to visit with them at the same time."

Dr. X may or may not come up with another person. If not, do your reading and select more people in the same area.

Repeat this cycle using either Dr. X's suggestions, or your own. The truly audacious will actually use Dr. X's name: "Hi. I am visiting with Dr. X in September, and he suggested I call you....." - academic brinksmanship at its very best! When you have thus mapped out a 2-3 day schedule, take it to your department chair and ask if your trip can be paid for from central resources, since it is a business trip. Indicate that you have several invitations to visit distinguished research labs, and to present seminars on your work. It will be an extremely hard-hearted (or impoverished) department chair who will turn you down. This kind of thing is extremely easy to do, and an excellent first step towards getting invited to meetings, having your abstracts selected as platform presentations at meetings, and simply getting known by your peers.

Aim to give at least three or four seminars, invited or self-generated, each year, to cover the main people in your field.

- Towards the end of this period you should get the scores on your first grant. If it's good news that is fantastic. If not, you have work to do. First call the grants administrator at NIH who helped with your application. Which of the several pages of comments was the most important in establishing the final score? Is the grant rescuable? In general (and this is obvious) if you are a few percentage points from the funding range, the grant should be rescuable. However, pay very careful attention to the comments that put it in this range, because this is not accidental. I have seen grants remain at the same scoreline through several rounds of study section meetings, because the applicant did not correct a particular fault that the readers felt was a particularly important one. This is also the time to take more advice from your mentors. Was it too ambitious? If so, which bits should you remove? Did it lack an essential preliminary experiment that would have made it more convincing? Were the ideas simply not good enough, or not well enough presented?
- Your teaching and committee work may well start during this six-month period or the next. Most starting faculty are spared these duties in their first year. Much has been written about how and how not to teach, and there is more pithy advice available than you can possibly absorb. In general, it is a good idea to match that advice to your local environment. What makes teachers "good" at your institution? You can find this out by going to lectures given by people who are generally regarded as good, or bad, teachers, and by asking the good ones how they prepare their teaching material, present it, and grade it. Go along to any "how to teach" programs offered by your institution. These programs are often more useful than they may seem, and if they include practice performances on video, can give you a terrible shock. "Do I really do that in front of the students??!!" This is a very good way to eliminate your worse traits as a teacher, and make you prepare seriously for your teaching. This is not the time or place for a manual for starting teachers, but here are some random tips for success in those first few important lectures:
  - 1) Most important; memorize your lecture. This is critically important, because if you do, it doesn't matter if the audio-visual fails, the lecture theater collapses, or your notes catch fire, you can still give your talk and leave with your head held high.
  - 2) Do not, under any circumstances, throw yourself on the mercy of the students. They don't have any. Starting lines like "this is my first ever undergraduate lecture, giggle giggle, so don't expect too much....." are suicide.

- 3) Do not make jokes until you have tenure. All those side-splitting witticisms about the sex life of the zebra mussel that occur to you while you are preparing your lecture will come back to haunt you when delivered in the cold light of a 9am lecture to a hungover and humorless audience of undergraduates. It is also a surprising but universal truth that every student audience contains at least one person who finds almost any joke offensive, and will write to the Dean about it. So, my advice is, be good-humored, but don't make jokes.
- 4) Do not make your lectures too long. Most students have had enough by 45 minutes. Breathless accounts of someone who can hold the students' attention for two hours or so are usually apocryphal, and even if true, should not be tried by an amateur.
- 5) It is almost impossible to make a lecture too simple. The intellectual abilities of your class will, like everything else, lie on a bell-shaped curve. Talk to the largest, middle section of the curve. If you lecture to the most able (10% say), you will alienate the other 90% of the students. There is a mysterious resistance to this idea amongst many (bad) teachers, who think that they look smart if their lectures are incomprehensible. The opposite is usually the case. The whole point of a lecture is to convey the most interesting aspects of the subject to a group of people who don't know anything about it. Remember this fact and you will do fine.
- 6) Use plenty of audio-visuals. Powerpoint has been wonderful in this respect. But don't lose the students in the audiovisuals. You have to provide a clear narrative that links them all together, and make them realize why they are watching them.
- 7) Get informal feedback after each lecture. Hand out a short score sheet. Don't try to make it too comprehensive, or nobody will fill it out. If you don't start doing this at the beginning, feedback will be too late to be useful. There is no point in waiting until the end of the course to find out how you did. If you are being too obscure, speaking too fast, or have some other dreadful flaw, you need to know about it while there is still time to correct it. There is one danger to score sheets, in that there seems to be an almost overwhelming urge for people to tick the middle score, thus reducing you, at the stroke of a pen, to an "average" score. If you are worried about this, hand out an assessment that asks for comments instead of a score. Since the same overwhelming urge seems to make people write "good", the same exercise, with the same people, will have lifted you to the "good" category.

8) Try to persuade other faculty members to sit in on your lectures.

- You may also be asked to do some committee work in this year. In my experience all advice is bad here. Some say that you should try to make your mark in the department, others that you will merely enrage your department chair by doing so, and so on. Once again, tailor what you do to your local circumstances. If committees really matter, and are truly democratic, work hard because your views will be important. If committees pay only lip service to democracy in your department, and are largely ignored by the chair, go along and try not to snore too loudly. Committees are useful to you as a new faculty member, because they bring you into contact with faculty who you would not normally meet (and can be surprisingly interesting, despite their obvious drawback in that they work in some other research area), and give you an idea of the structure of the institution.

#### **The fourth six months.**

- From now on, it all depends upon how things have gone so far. If you did not get your grant first time, you need to repeat the previous sections. If you got your grant, and are getting your first papers accepted, it is time to start building your team further. This would be a good time to bring a graduate student into the lab. You have secure funding for as long as it takes them to graduate, and you have more time to focus on training them. Your efforts at promoting yourself outside your home institute may have produced some postdoc applications. If not, call your colleagues (with big labs) at other institutions, preferably ones where you have visited, and ask if they have someone about to graduate who is looking for a postdoc in your area. Continue to make a pyramid structure in your lab. If you don't set this up, everything will stop every time you are not around to troubleshoot.
- You should be submitting at least your second research publication at this time. One major publication per year is the goal.
- You should be having your second formal evaluation by your department chair. Once again, if there doesn't seem to be a formal procedure, ask for it anyway, and try to get a written assessment of your performance.

#### **The third year.**

In most places, this is the year of your first reappointment, which is usually automatic. However, you should take this opportunity, perhaps at the annual evaluation session, to ask your department chair if you are on target for a tenured position, or whether you should be thinking of fallback options. Do not

be afraid of this question. If you are not on target, it is imperative that you know this, while there is still time to change the situation, or change your career goals. Remember that your chair is not necessarily an adversary here. He/she may be extremely helpful in suggesting or arranging alternative career possibilities. Honesty is by far and away the best policy at this stage in your career.

Take stock at this point. Ask yourself how many things on the above list you have accomplished. Do you have two major papers published? Do you have a federally funded research program? Did the first year of teaching go well? Do the major players in your research area know who you are? If the answers to all these questions are yes, think of applying for a second grant. Other things to think about that will keep you on an upward trajectory are:

- 1) Try to get an invited platform presentation at a national or international meeting. Do not be afraid to call the organizers of an upcoming meeting and ask if there is a slot.
- 2) Go to your national society meeting, and suggest a session at the next annual meeting. You could end up organizing it, in which case you can invite yourself.
- 3) Call all the journal editors in your field and suggest a review article. Have a brief synopsis of your planned review ready to email to them. There are two kinds of review, snappy ones with silly titles which are easy to write, and longer scholarly ones that are not. However, citations for the latter tend to be much higher, so may stand you in better stead than the former.

Whilst doing these things, remember that you need another major publication this year, and continue your teaching. Do not lose focus on your day-to-day research. Doing research and publishing it remains your primary goal. Everything else is secondary to this.

At the end of this year, you should approach the chair of the tenure and promotions committee at your institute, and find out exactly how you will be judged, and how you currently match those criteria.

#### **Fourth year on.**

No more specific time-related advice is required. If you have reached this point and are still employed, things are going OK. Here are some general thoughts on your continued development.

- 1) Perseverance is generally rewarded. This is true of both publications and grants. Perseverance is prized in this country, and you should use this fact. Here

is a case study. One of my close colleagues had a paper turned down by a major journal. He wrote a six-page rebuttal of the reviews, managing not to once insult the reviewers, merely arguing the arguable points, and responding to the unarguable ones by presenting new data, or new arguments. The paper was turned down again. My colleague responded with an equally polite three-page reply, including more data and clearer arguments. This time the paper was published. Remember that journal editors have only one goal, to publish the most interesting and scientifically correct papers in their journal. If you respond to an outright rejection by the inclusion of new data that answers the reviewers' criticisms, and clearer enunciation of your interpretation (if that was the problem), then the editor is morally bound to take another look at it. If there is significant evidence (not just your "feeling") that a reviewer was biased, ask for another one (but don't be too quick to do this; most reviewers, despite our natural paranoia, are fair, and will listen to reason). Publishing a paper is an interactive process, and your first response should not be to simply send the same paper to a journal further down the pecking order. This should only be done if the reviewers simply did not find the work of sufficient significance for publication in your chosen journal. From personal experience, I know that many authors regard rejection of their paper as merely the opening gambit in their campaign. The same rules apply to grant applications. If you are careful to respond to the reviewers' criticisms, there is a good chance that you will receive a higher score next time. The one major problem here is if study section membership changes while you are revising your grant. If that happens, make sure your introductory material indicates both the reviewers' original comments and how you have responded to them. This can alert the study section chair to fact that he/she should try to avoid presenting you with a new set of obstacles from the new reviewers. You can reduce your chances of this happening by checking the roster of study section members, and calling the administrator of the study section to discuss the problem if membership changes.

2) As your lab grows, try not to get distanced from it. I personally think that all PI's, whatever their rank, should continue to work in the lab. However, this is rare, often with unfortunate consequences. If you are going to leave your precious research to be carried out by someone else, be highly selective in your choice of lab members. Never give in to the argument that since this is the only applicant, you had better take him/her. A poor research member of your lab can lose your grant for you. Once you stop actually working in the lab, and start managing it instead, you are entering an area for which you are completely untrained, and which can be surprisingly difficult. I advise people to continue to work in their labs every day, even if they do something technically undemanding. It offers the opportunity for continual interaction with lab members, a share in the successes and failures as they happen, and a chance to see first hand if there is something in the lab that needs fixing. Think of ways to

maximize your interactions with your lab members. Although it sounds counter-productive, I took up golf!! It is the only opportunity I get to talk to my postdocs and graduate students for four hours without the telephone ringing.

3) Don't be adversarial, except as a measure of last resort, and if you have genuinely been wronged. Peer review of manuscripts, grants, and finally of yourself, is a fact of life in academia. It is not intended to be adversarial, merely selective. In corporate life, your job can be terminated on a whim. This is not supposed to happen in academia. Instead, there is a ponderous selection process that in most places (for in most places, the majority get tenure) benefits the majority. Even if your private view is that tenure decisions are made by academic coelocanths who are incapable of coherent thought, remember that it is your objective to become one of those living fossils, and that you will be similarly regarded by those who follow.

### **For the academic clinician**

The variation between institutions is huge, so only generic advice can be given.

1) Assessment for tenure includes the added component of clinical competence. This is usually provided by your division director, or department chair. The evidence used for this varies widely. Ask your division director early, and straightforwardly, what your goals are, and get annual written confirmation of your progress.

2) Protected time. This is a thorny issue, because it is so elusive. Optimally, 70% of your time should be protected. Any less will not permit the kind of research effort required to generate an independent, federally funded research program. Every young academic clinician treads a fine line between enforcing the protected time promised at the time of appointment, and alienating his/her division director/department chair. In terms of realpolitik, this translates into the unfortunate fact that the attribute of diplomacy has to be added to the already impressive list of attributes required for a successful tenure decision.

3) Mentorship. This becomes extremely important if your research will be in basic science. Medical school, residency, and fellowship will probably have excluded much opportunity for basic research (unless you were fortunate enough to have been at an institution where clinical and basic science were well integrated). So you start off at a disadvantage once your tenure clock starts ticking. The key to success is finding a good mentor, who will allow you to use his/her research facilities, and become part of his/her group, but carrying out independent research. The mentor does not have to be doing research exactly in your area, but should use the same technologies, and general research strategies, since these are the things you have to learn. Get your department chair to promise you your own lab when you have outgrown this nest; usually when you

get your first grant. They will usually be only too pleased to do this, since it will save them both money and space in the short term.

4) Time. In most institutions, the tenure clock is ten years for clinical faculty. This does not mean that the advice given above does not apply, but you can alter the timetable accordingly.

5) Focus. Whatever the promises about protected time, it won't work that way. There will be a sudden shortage of operating room time, so that one comes available every time you are starting your pcr reaction, and so on. It is very hard to set aside large blocks of time to enable you to proceed all the way from the creative reading and thinking part to the actual conclusion of an experiment, without being interrupted. Because of this you have to focus on a smaller number of projects. You simply don't have time to diversify. Collaborations can help here, but don't prejudice your independence.

6) Remember that patient-oriented research required extensive formal institutional training and complex protocols. This can be as time-consuming as learning the nuts and bolts of basic science. Find out early in your planning what the requirements are in your institution.

### **And last thoughts, the tenure process itself.**

The actual process of the tenure decision varies dramatically from place to place, so the following is generic advice. Institutions can be roughly divided into those with an open policy, in which you see your file, and those with a closed policy, in which you do not. I will describe the situation at my institution, which has an open policy. I work in a large clinical department (approx. 400 faculty) which is divided into divisions.

Step 1. Division director's letter of recommendation. This is based on the applicant's tenure dossier, his/her opinions based on annual evaluations, and letters from external experts in the field of research.

Step 2. Departmental Promotions and Tenure Committee discusses the tenure application, and writes a memo to the department chair.

Step 3. Department Head writes a letter of recommendation, based on steps 1 and 2, and any other evidence he/she has concerning the application.

Step 4. The College of Medicine Tenure and Promotions Committee meets, and writes a letter of recommendation to the Dean.

Step 5. The Dean makes a decision to support or not to support the application for tenure, writes a letter to the Provost.

Step 6. The provost approves the application.

Step 7. The president approves the application.

Step 8. And finally it is approved by the Board of Trustees.

This process generally takes about six months (but can take much longer in some institutions).

Remember, intervention is possible at all levels in this process. So don't stop whatever you were doing to get tenure before the whole process is complete. Some variation on this process occurs in all academic institutions, but details differ.

**Your tenure dossier will usually contain the following:**

- 1) Evidence of significant and continuous funding. Usually at least one NIH grant (two in some institutions) and its successful renewal.
- 2) Evidence of publication of a significant body of research in high-quality peer-reviewed journals. How this translates into actual numbers in actual journals varies by both institution and field of research. Check successful dossiers in both.
- 3) Evidence of a national/international reputation, in the form of a list of scientific presentations, any invitations to meetings or seminars, and letters from leaders in your field of research. Here, the division director is responsible for getting letters, but may well ask for your suggestions. Some institutions will ask the candidate for suggested references, others select their own, others do both. Check on your own institution's policy. Close adherence to the suggestions above will ensure that you have a selection of suggestions in hand if necessary. You will have learned from the above to network well, and to avoid alienating yourself from the colleagues in your field.
- 4) Evidence of teaching excellence, in the form of student and peer assessments, and lists of teaching assignments.
- 5) Evidence of "service" (i.e. committee work) that shows you are likely to be a useful citizen in the future. This will include a list of committees you have served upon, and any comments on this from your department chair.
- 6) A self-statement from you, the candidate. In an open institution, you will have seen your tenure dossier, and will have seen the comments of the department chair and division director, and the external reviews. Your self-statement is therefore an opportunity to address any negative statements, or reinforce the positive ones. Self-statements come in many forms, but should include a brief description of accomplishments, your career goals, and some indication of commitment to the institution (remember you are asking them to appoint you for the rest of your working life).

Remember when considering these steps first the snowball effect, and second that each level looks at your dossier with a different perspective.

1) The snowball effect. It is generally not in anybody's interest simply to overturn recommendations. A department chair, unless he/she has some special knowledge of the candidate (a behavioral issue, for example), will not randomly contradict a formal recommendation letter from either the division director or the departmental committee, and so on up the chain. This means you should focus on the early steps in the process for maximum effect, since a very strong recommendation right at the beginning will rapidly gain momentum, and additional plaudits along the way, until it (hopefully), it gets too big to stop.

2) Different perceptions. A university committee, or Dean, may have all sorts of hidden agendas. It is unlikely, but not beyond the bounds of possibility, that the Dean may have personal, scientific, or financial reasons for wanting to cut back the number of faculty in your department, with obvious consequences. The only way you can avoid this is to check during your recruitment whether there is any obvious instability in the department's situation. Is the department chair about to retire? Is the Dean about to retire? Is the department regarded externally as a strong one? Is the department chair a strong one? People expect you to ask these questions when you are being recruited, so make sure you do.

## **Conclusion**

This is a long list of do's and don't's. Most of them will be unnecessary to most young faculty. However, everyone should seek to maximize their chances of success, and if you do most of these things, your road to tenure should be a smooth one.

Chris Wylie 7/02