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LAB LIFE

Learn to lead

Laboratory heads often aren't properly trained for their job. Here's what they need.

New principal investigators (PIs) tend to be thrust into a role that includes administration and management, budgeting, lab infrastructure, mentoring and — perhaps most difficult — shepherding junior scientists to achieve their full potential. Many researchers receive little training in leadership skills to help them adapt. And the problem is not limited to just new PIs. In *Nature's* 2017 survey of PhD students, one-quarter of the respondents were dissatisfied with their adviser's guidance on research, and only one-third said that their supervisors gave useful advice about non-academic careers.

Nature asked leadership experts what lessons other industries can offer to help scientists become more-effective PIs.

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PETER HIRST Treat science like a business

Associate dean of executive education at the Massachusetts Institute of Technology (MIT) Sloan School of Management in Cambridge.

Our programmes at Sloan on management and leadership attract people from fields such as financial services, government, engineering and the life sciences. In my view, it would help scientists to think about the parallels between science and the corporate world: understanding what the product is, who the

customers are and whether you're creating value for them. In scientific research, your 'customers' aren't necessarily paying you. But a lot of scientists would say, "My customer is the research community; I'm helping to advance this field."

There are ways to measure the impact of your work and to improve the return on resources you're putting in. For example, you could measure the number of citations, publications or revisions needed to get a paper accepted. Once you have your scorecard, you can look for opportunities to make sure you're focusing resources — your own attention, your students' efforts and lab equipment — to improve those measurements.

Techniques developed for the manufacturing industry can help you to visualize where things have become stuck. Think of a lab ▶

► as manufacturing science. Presumably there's some output you're trying to produce. You can apply these approaches to get more throughput.

To use these techniques in a lab, identify every activity or piece of work and write it on a Post-It note. On a large wall or whiteboard, set out the process that tasks flow through. All participants can refer to the visualization on an ongoing basis; it's a continuous representation of the work happening. Some tasks will depend on the outputs of others; task B can't be done until task A has been completed. Maybe team A is characterizing an organism and handing that knowledge on to team B.

You could use traffic-light colour-coding to highlight something that is stuck or has a high error rate: green means everything's going as it should, yellow means we need to keep an eye on it and red means it needs work. Say you want to modify a piece of equipment to improve its performance. But you discover that you need a part that has to be manufactured specially, so the task becomes a yellow flag. Then you find out that it will take six months to make the part, so the project becomes a red. At that point, you seek insight from throughout the organization; for instance, a colleague in an adjacent lab might have had a similar problem and be able to suggest an alternative solution.

It's valuable for scientists to learn about business concepts. The unifying entity is human beings; whether you're leading a business or an academic lab, you depend on getting people to work together to achieve things.

Scientists could ask faculty members in their university's business or management school whether the institution has courses on these techniques (see 'Training options'). Or they could request peer coaching and say, "Your work looks interesting, and I'm curious if I could use these ideas in my lab. Would you help me to understand it?" Investing in your skills will pay dividends for you and those around you.

SEN SENDJAYA Lead by serving others

Leadership researcher at Swinburne University of Technology in Melbourne, Australia.

I have trained people on an approach called servant leadership, which involves serving those whom you lead. Many leadership styles focus on manipulating followers to go the extra mile so that the employer can

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squeeze more effort out of them, and the end game is to increase the bottom line. Servant leadership is different because it focuses on followers' holistic development and puts their needs above those of leaders.

For example, instead of saying "I expect you to have the report written by Monday at 9 a.m.," a servant leader would say, "What do you think of this expectation? Would you be able to fulfil it?" They might ask whether there is anything going on professionally or personally that would hinder productivity and that the servant leader can help with.

Another distinctive thing about servant leadership is a 'hunting licence': the leader tells followers that they can ask difficult questions and disagree. Servant leaders are willing to be vulnerable and admit mistakes. The key is to communicate this quite regularly because it's human nature to not openly disagree with people above us. Leaders need to remind followers, "I'm not infallible, so you need to tell me if I'm doing something out of line."

Servant leadership is applicable to scientists because people who work in labs are highly creative. Creative people tend to be more autonomous and self-motivated than the average employee; they often don't want to be told what to do. So PIs might not be able to rely on traditional influencing techniques such as hierarchy-based authority.

My team and other researchers around the world have conducted studies on servant leadership in sectors such as manufacturing, hotels, restaurants, airlines, financial

services and government. Servant leadership has been shown to boost employee commitment, team-members' performance, intention to stay with the organization and the performance of the company, compared with other leadership approaches. The approach is starting to become more mainstream.

Business practitioners often have difficulties with servant leadership because they think they'll be treated like a doormat. But servant leadership does not operate out of weakness or lack of self-respect. Only those with a secure sense of self can serve others through their leadership.

SUE HEWITT Make time for training

Proprietor of Develomenta, a training consultancy in Denbigh, UK.

We shouldn't put scientists in leadership positions without giving them support. Employees of many corporate organizations and the UK civil service (national and local government workers) often receive leadership training through workshops and courses, for instance. In academia, however, there is less of an expectation that someone who progresses to a management role will be supported with leadership development.

As a PI, you might avoid seeking leadership training because you don't feel you need it, or because you're too busy. But you don't have time not to do it. For example, if you learn about delegation, think about how much more effective you will be when everyone in



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the lab is helping you to do things, instead of doing them by yourself.

I teach scientists how to coach people, which means having a conversation to help staff or students to solve their own problems. The main coaching model is called GROW, which stands for goal, reality, options or obstacles and will or way forward. It's a simple technique for asking questions to identify the issue, the current reality, the options and what the person is going to do. For many PIs, it takes a great weight off their shoulders when they realize that they don't have to solve everyone's problems.

For example, if a student thinks that their results aren't good enough for a conference presentation, you could explore what 'not good enough' means. You might find that the student is unduly anxious about the quality of the work when, in fact, the more important thing is for them to get feedback on their initial findings from people at the conference. Other meeting attendees who have used a similar experimental technique could then talk to the student about how they saw the same problems or improved their data. As the PI, you might not know exactly how to improve the results if the student is using a new technique. But by presenting the work and getting their own feedback, a student can take more ownership of the project.

Many PIs feel that they aren't able to give students advice on non-academic careers, such as scientific publishing. Most PIs have never done that type of work. But they should be able to say: "I've submitted a paper to this journal; maybe I could ring them and ask someone

to talk to you." There are many ways to help. It's difficult to provide training to PIs on this issue because of the huge variety of careers that people can choose, but PIs can bring students together with the university's careers service or with an organization such as hfp consulting in Heidelberg, Germany, which offers professional development workshops for scientists.

It's also important for female PIs to have access to women-only leadership training. I run courses for female scientists, and cover a lot of the same material as standard leadership courses, but with a gender slant. For example, the courses ask about their experience in giving or receiving feedback as a woman, and help them to be more confident. Because we provide an environment in which all the participants and many of the trainers are female, women's voices are easier to hear. Dealing with feelings about coming back to work after maternity leave, for example, is openly talked about. Female PIs should ask their universities or funding bodies whether they provide leadership training for women and make a case for them to do so. We already have the evidence that there aren't enough senior women in science.

KEN INGRAM Embrace the uncertainty

Head of practice at Roffey Park Institute, a leadership-development organization in Horsham, UK.

We find that experts often have trouble when they get to leadership positions. By 'experts,' I mean anyone who has been successful because of their skills or knowledge, whether they're, say, a nurse, an accountant or a scientist. They often experience 'impostor syndrome', and think, "I don't feel competent because this is a new skill set, and it's not what I relied on to get me here." It can be quite an anxiety-producing time.

Many people who are used to being in a position of expertise feel uncomfortable with the ambiguous nature of managing people. When they were in specialist roles, there were certain procedures and outputs expected. For a web designer, success is clear: a great webpage that attracts people. But when that person becomes a leader, they're no longer creating the webpages; they're helping other people to do so, and that can be difficult. They often instinctively revert to what they feel most comfortable with — for example, doing the web design themselves. But it's important to let team members come up with their own ideas and have some autonomy, because that's how people learn.

Experts often seek a single truth that is pure fact, but leadership is greyer than that. For instance, one team member might feel that they are always interrupted in meetings. They

might feel bullied, and see the person talking over them as arrogant, whereas the person behaving that way might say, "I was passionate — I'm an extrovert, so I speak what I'm thinking." A leader with a 'single-truth' mindset might dismiss one person's point of view. But that's not helpful in an interpersonal situation, because everyone experiences the world differently. Instead, the leader should help both parties to see the other person's point of view.

KATE MACMASTER Cultivate self-awareness

Programmes director at the Peter Cullen Water and Environment Trust in Canberra, Australia.

Our Science to Policy Leadership Program is aimed at emerging and current leaders in Australia who work in water and environmental management. A lot of them are scientists. Part of the process we take them through is increasing their awareness of personal purpose and values. Participants are asked to take a psychometric test called DiSC, which stands for dominance, influence, steadiness and conscientiousness. They answer multiple-choice, scenario-based questions, and the test assigns them a broad personality type. For example, dominant people tend to focus on getting results quickly and succeeding, and conscientious people are more concerned with understanding details and working carefully.

The important thing to remember is that you are not necessarily just one profile; you can have parts of all four. But the test does give your general preference in any situation, and the aim is to notice and be aware of it. For example, I might be required to lead my group and make high-level decisions. If I know my personality preference is to get stuck in the details and micromanage, and I notice myself acting that way, I can reflect on the spot and behave differently: "I'm going to stop doing that, go back to high-level strategy and trust my team."

My advice to principal investigators is to spend some time with your team identifying your shared purpose and values. You might decide your values are hard work, respect, honesty and integrity. Then, if a project gets off-track because people aren't, for instance, working hard or acting with integrity, you can bring the group back together and say, "Let's revisit our values and talk about how we're doing." Once the team is aligned with a clear purpose, you find increased trust in the group. Trust is the foundation for any high-performing team, whether they're scientists, politicians, schoolteachers or retail assistants. ■

INTERVIEWS BY ROBERTA KWOK

Interviews have been edited for clarity and length.

TRAINING OPTIONS

Available courses

Here are some organizations that offer leadership programmes geared towards scientists.

- hfp consulting in Heidelberg, Germany, runs a variety of professional-development workshops for scientists at all levels.
- Cold Spring Harbor Laboratory in New York runs annual interactive three-day workshops on leadership in bioscience.
- The University of California, San Francisco, offers a 16-hour course on scientific leadership and management skills that targets people hoping to lead research groups
- The Technical University Berlin, the Humboldt University of Berlin and the Free University Berlin have joined forces to offer their female researchers a programme named ProFIL, which combines mentoring, seminars and training sessions.