

# Managing to Excel at Science

Amid growing recognition that a successful scientific career requires skills beyond scientific acumen, institutions are racing to provide management training for newly minted principal investigators.

Young scientists spend years conducting complicated experiments and crunching data, but when they are finally given the keys to their own lab, they suddenly face tasks they were never trained for in graduate school. “Assistant professors are hired based on their scientific research accomplishments, but their success as faculty members is very much related to their ability to manage a small business,” says Tom Cech, President of the Howard Hughes Medical Institute. Most newly minted principal investigators have minimal training in business skills, yet their survival requires management abilities such as making hiring decisions, mentoring, providing performance evaluations, giving lab members appropriate feedback, budgeting, obtaining research funds, grant writing, and time management, Cech says. “A little bit of training can help people avoid the pitfalls.” HHMI was among the first to recognize the need for management training for young scientists. In 2002, HHMI joined with the Burroughs Wellcome Fund (BWF) to pro-

vide a laboratory leadership and management course at HHMI’s headquarters in Chevy Chase, Maryland. The course, specifically designed for senior postdocs and new faculty members, covered everything from negotiating your first position to navigating tenure, hiring and managing lab members, teaching and mentoring, project management, and collaborations.

The course was so successful—with more than 250 applicants for 100 slots in the first year—that demand threatened to outstrip the capacity to provide it. “We decided that this is not really something that [we] should take on,” says Maryrose Franko, senior program officer for graduate science education at HHMI. “If we became known for this then people would expect us to keep doing this for everybody forever and we don’t think it’s our responsibility,” she says. “We wanted to use our bully pulpit to encourage other institutions to do this for their own scientists,” says Franko. “Our message is—you need to be doing this but we’re here to help you.”

So when the course was held again in 2005, HHMI/BWF invited people from more than a dozen organizations and institutions to attend not only the course but also an additional “train the trainers” program. “Those who participated had to commit to putting on a program at their own institution and to go back and take notes on their development process,” says Franko. “We asked them, at your institution—on a shoestring budget—how would you do this? That’s how the trainers course came about,” she says. Those in the “train the trainers” program participated in the lab management course just like other attendees, but their work continued into the evening. “After each day, we had a debriefing program,” says Franko. “We asked them, what worked? What didn’t? What would you do differently? How would you spin this differently at your institution?”

## Taking the Workshop Back Home

One attendee, Joan Lakoski, Assistant Vice Chancellor in the Office of Academic Career Development at the University of

**Table 1. Organizations Hosting Laboratory Management Courses**

American Society of Human Genetics	<a href="http://www.ashg.org/meetings">http://www.ashg.org/meetings</a> (held in conjunction with the annual meeting)
American Physiological Society	<a href="http://www.the-aps.org/education/profSkills2007/index.htm">http://www.the-aps.org/education/profSkills2007/index.htm</a>
American Society of Plant Biologists	<a href="http://www.aspb.org/meetings/pb-2007/labmanagement.cfm">http://www.aspb.org/meetings/pb-2007/labmanagement.cfm</a>
Association for Academic Surgery	<a href="http://www.aasurg.org/documents/WACSFINAL.pdf">http://www.aasurg.org/documents/WACSFINAL.pdf</a>
Children’s Hospital, Boston	<a href="http://www.childrenshospital.org/cfapps/research/data_admin/Site1002/mainpageS1002P28.html">http://www.childrenshospital.org/cfapps/research/data_admin/Site1002/mainpageS1002P28.html</a>
EMBO	<a href="http://www.embo.org/yip/lab_mgm.html">http://www.embo.org/yip/lab_mgm.html</a>
FASEB	<a href="http://www.faseb.org/careers/eb2008/pages/page2a.htm">http://www.faseb.org/careers/eb2008/pages/page2a.htm</a> (held in conjunction with FASEB meetings)
Harvard Medical School	<a href="http://www.hms.harvard.edu/fa/leadership/index.htm">http://www.hms.harvard.edu/fa/leadership/index.htm</a>
Medical College of Wisconsin	<a href="http://www.mcw.edu/phdsymposium">http://www.mcw.edu/phdsymposium</a>
National Postdoctoral Association	<a href="http://www.nationalpostdoc.org">http://www.nationalpostdoc.org</a>
Northwestern University	<a href="http://www.research.northwestern.edu/ord/events/NavigatingtheProfessoriate.htm">http://www.research.northwestern.edu/ord/events/NavigatingtheProfessoriate.htm</a>
Stanford University	<a href="http://postdocs.stanford.edu/education/Scientific_Management_2008.html">http://postdocs.stanford.edu/education/Scientific_Management_2008.html</a>
TRAYSS PRIME	<a href="http://www.scanbalt.org/sw11850.asp">http://www.scanbalt.org/sw11850.asp</a>
UK GRAD	<a href="http://www.grad.ac.uk/cms/ShowPage/Home_page/pleeccddl">http://www.grad.ac.uk/cms/ShowPage/Home_page/pleeccddl</a>
University of Arizona College of Medicine	<a href="http://www.medicalresearch.arizona.edu/niworkshop.cfm">http://www.medicalresearch.arizona.edu/niworkshop.cfm</a>
University of California-Davis	<a href="http://www.innovationaccess.ucdavis.edu/home.cfm?id = OVC,14">http://www.innovationaccess.ucdavis.edu/home.cfm?id = OVC,14</a>
University of California-San Francisco	<a href="http://www.ucsf.edu/career/">http://www.ucsf.edu/career/</a>
University of Cincinnati and Cincinnati Children’s Research Foundation	<a href="http://www.uc.edu/ucResearch/Research_Orientation.html">http://www.uc.edu/ucResearch/Research_Orientation.html</a>
University of Pittsburgh School of Medicine	<a href="http://www.oacd.health.pitt.edu/leadershipcourse/index.html">http://www.oacd.health.pitt.edu/leadershipcourse/index.html</a>

Pittsburgh, used her experience from the program to organize a course on scientific management and leadership at the University of Pittsburgh's Schools of the Health Sciences (Table 1). The two-day course, now in its third year, focuses on team building, ways to develop and manage a scientific research program, and tools for productivity. Since its inception, the course has increased its emphasis on interpersonal skills. "Over and over, we've had requests to increase discussion on conflict management," says Lakoski, "so we've increased the amount of time devoted to skills related to managing interpersonal conflicts and negotiation."

The program also walks participants through strategies for navigating the university system and tenure. "Originally we had included a session on project management, but we had trouble finding someone who could address project planning in a way that clicked with scientists, so last year we substituted a session on how to talk to your department chair," says Lakoski. "We're constantly tweaking the material. This year we're doing a session on how to identify resources beyond the NIH for research funding."

Nuria Pastor-Soler, an assistant professor at the University of Pittsburgh School of Medicine, says the course helped her to identify good and bad traits in her leadership style and to better work with those whose personality types differ from her own. "The concept of fast-processing and slow-processing temperaments was very interesting to me," she says. "I used to get very impatient when some of my colleagues would take one week to reply to what I considered a simple request for advice. I am now much more understanding of the fact that some of my colleagues may need much more time (on their own) to reflect upon all the information before giving me their opinion." Her colleague assistant professor William Lariviere says he constantly relies on the time management skills he learned in the workshop. "There are only so many hours in the day. The course carefully outlined how one can deal with the constant barrage of information and demands that we endure daily, keeping the overall goals in sight." Attendees like Pastor-Soler and Lariviere have responded so positively that many University of Pittsburgh senior faculty have expressed interest in a course for

established principal investigators, says Lakoski. As a result, organizers are now thinking about offering a slightly different course for more senior scientists.

Lakoski and others who attended the HHMI/BWF "train the trainers" program provide a valuable resource for others who are looking for ways to make this happen at their own universities. "I've had a few phone calls from other institutions," says Lakoski. "I'm happy to serve as a resource. Anyone who wants to can come to Pittsburgh to observe our course," she says. "We have a network of people here to help," says HHMI's Franko. "We give out names of the partners, and people can use their modules and share strategies—things like, how are you getting your money? How are you measuring success?" Currently, HHMI is compiling a database of organizations that are using their resources and "this will provide a community where everybody can share and see who's doing what," says Franko. The database should be completed in the next few months.

Although there are no plans for another HHMI/BWF lab management course, information from the two courses and the "train the trainers" program is now available as a book, *Making the Right Moves: A Practical Guide to Scientific Management for Postdocs and New Faculty* (freely available at <http://www.hhmi.org/resources/labmanagement>). The book's 13 chapters cover negotiating a faculty position, tenure, staffing, mentoring, time management, project management, data management, funding, publishing, technology transfer, collaborations, and teaching. This book is not intended as a substitute for an actual lab management course but rather serves as a guide for postdocs and new principal investigators, and also for administrators who want to put on a course at their own institutions.

### Europeans Join the Management Movement

Across the Atlantic, the European Molecular Biology Organization (EMBO) has developed its own lab management program. Gerlind Wallon, who manages the EMBO Young Investigator Programme, consulted with HHMI's Franko but soon realized that the EMBO version of the course would need to be tweaked to meet the needs of European scientists. "The HHMI course covered many other things,

like how to write NSF/NIH grants, that you cannot transfer to Europe," says Wallon. The EMBO course began as a classroom-style experience, but "it didn't accomplish much more than reading a book so we've completely changed it," she says. "We had a big discussion and debate at the beginning," notes Wallon. "I thought it would be crucial to have instructors who had a scientific background, but I have to say that now I don't think it's crucial. Yes, it's important that trainers have a feeling for the people they're working with and one of our trainers does have a PhD in math," she says. "But it's not necessary for them to be scientists. They need to be familiar with that environment, but they don't have to come from it."

The EMBO course now features a format that emphasizes practical learning, with break-out groups that try out key concepts using real-life scenarios and role playing. "These courses are very hands on. You're in a small group so you can't hide and you are actually testing these things out on each other—it's very focused on people management," says Wallon. "You come out of it having tried out these things. You get hands on experience using this with your peers," she says.

Han Kiat Ho, a senior research fellow at the Institute of Medical Biology in Singapore, attended an EMBO lab management course on the advice of his advisor, EMBO member Axel Ullrich. Ho says he left with a better understanding of how to manage and mentor his lab members. Although it seemed tedious at first to coach lab members to solve their problems themselves instead of merely giving them the solutions, Ho emphasizes that "lab members will learn to solve problems independently and effectively, and interaction time with them will become productive." Ho says that in his native Singapore, there is a growing awareness of the need for effective lab management, and some local and regional consulting companies are beginning to conduct management courses for biomedical research institutes. But for now, he says, "the EMBO lab management course remains unparalleled."

Closer to home, Eduardo Moreno, a new group leader at the Spanish National Cancer Center (CNIO) in Madrid, attended the EMBO course last January. He says the program opened his eyes to how cultural factors could influence people's work

habits in the lab. “We learned that different cultures use their time differently—some cultures are sequential and others more synchronic,” he says. “In some cultures the time is more flexible and you can do several things at the same time. Other cultures like to do one thing at a time,” says Moreno. “You have to accept that different people in your lab may require different types of attention and you need to treat them individually,” he says.

The EMBO course also includes a personality analysis. Participants were put into teams of two, told one another’s personality type, and then forced to work together. “I tend to focus on solutions, so the more solutions I find the more confident I am that we are doing well,” says Moreno. His partner, however, was “more of a perfectionist, and when there was one solution there she was happy, but when we had two, she started to feel stressed,” he says. That experience helped Moreno understand the need to personalize approaches to management and mentoring. “What works for one person may be a stress to another,” he says.

Moreno had to travel to Germany to attend his EMBO course, but this month, the EMBO course is coming to Spain. Like the HHMI/BWF program, EMBO is keen to share its know-how with others. “We have had requests from different institutes throughout Europe,” says Wallon. EMBO relies on freelance contractors to teach their lab management course, and they happily share these trainers with other institutions who request them. This month, the Institut d’Estudis Catalans (IEC), located in the heart of downtown Barcelona, will host a workshop entitled “The Art of Leadership: Fewer Conflicts, More Results—A Laboratory Management Workshop for Established and Prospective Group Leaders.” The course is open to scientists from a variety of institutes. “EMBO and the course organizers have advised us that a mix of internal and external participants creates an atmosphere more conducive to open communication,” says Sarah Sherwood of the office of Communications and External Relations at Barcelona’s Institute for Research in Biomedicine.

“We’ve fully booked the course and have people on the waiting list,” she says. The workshop was organized in collaboration with the Banco Bilbao Vizcaya Argentaria Foundation, which helped with funding, Sherwood says. The workshop will use instructors from the EMBO course and will follow their model.

Likewise, Cancer Research UK (CRUK) has also turned to the EMBO model for providing management training to its scientists. “Cancer Research UK has been working in collaboration with EMBO, the European Molecular Biology Laboratory, the Sanger Institute, UK Medical Research Council and the Institute of Cancer Research to explore opportunities for leadership and management skill development within our scientific community,” says Sarah Burns, CRUK’s learning and development manager. “As part of this collaboration we are looking at bringing the EMBO Laboratory Management Course to the UK. This course has received excellent feedback from the Cancer Research UK scientists who have attended it in Heidelberg and by bringing it to the UK we hope to make it even more accessible to our scientists,” says Burns. CRUK plans to run a workshop called “Leadership in Science” at the next National Cancer Research Institute (NCRI) conference in Birmingham this October. “The workshop will aim to explore what are the main challenges leading scientific research in the 21st century, how a balance can be struck between leading science and people and how we can prepare the leaders of the future to face these challenges.”

Meanwhile, in Europe’s Baltic Searegion, the not-for-profit organization ScanBalt, a meta-network of biotech companies, has teamed up with two private German consulting firms, Steinbeis Team Nordost and Prosciencia GmbH, to provide a series of management workshops, dubbed TRAYSS PRIME, for graduate students, postdocs, and junior group leaders in both industry and academia. The series of eight seminars are taking place in Hamburg, Berlin, Copenhagen, Gdansk, Krakow, and Turku through June 2008. The workshops focus on three topics—research project management, the EU research framework

program application process, and commercialization and intellectual property (IP) management in biotechnology. The program aims to fill gaps in traditional scientific training, says Henner Willnow of Steinbeis Team Nordost. “The need for management of labs and work groups is fast growing,” she says. Unlike the stand-alone workshops held by HHMI and EMBO, the TRAYSS PRIME seminars are conducted at international conferences. This strategy allows for synergy among the host organizations, the conference organizers, and the TRAYSS PRIME team, says Willnow. By the end of this year, the TRAYSS PRIME program will have trained some 150 young researchers.

But TRAYSS PRIME is not the only group offering management training at conferences; professional societies, such as FASEB, also offer management skills workshops at their meetings. Still, as welcome as such programs might be, the University of Pittsburgh’s Lakoski argues that ultimately the task of providing management training should rest with a scientist’s home institution. “The real issue is, who accepts responsibility for the success of postdocs and faculty at an institution?” says Lakoski. “I think that is an institutional responsibility.” Although she encourages young scientists to participate in workshops held at FASEB and other conferences, Lakoski says that these should supplement programs at a scientist’s home institute. HHMI’s Franko agrees. “I think the majority of training should come from universities—they should provide this for their postdocs and junior faculty,” she says. “It’s a statement on how you treat your people, if you treat them well in the beginning, it’s a good investment.” HHMI President Tom Cech points out that it is also to an institution’s advantage to ensure that new hires get the help and guidance they need to successfully manage a lab. “Institutions invest so much, they may have several hundred applications for a job, and they pick the top person,” says Cech. “A department has a lot riding on the success of the new faculty member, and that person’s success or failure will depend to some extent on how well they can manage their lab,” he says.

**Christie Aschwanden**  
Cedaredge, CO, USA  
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