EMBO reports

analysis

Mastering new skills

Being a group leader involves more than just practicing science. Lab management courses can help

Being a group leader is probably one of the hardest and most challenging jobs the natural sciences have to offer. On establishing their first research group, scientists are immediately under pressure to publish in a number of high-impact journals to qualify for a professorship. Many have to search for funding and apply for research grants, often without the help of their department or senior colleagues. Suddenly they are burdened with an onslaught of new problems, which were largely unknown to them as postdoctoral researchers. A lab needs to be staffed, and a newly appointed group leader faces the difficulties of advertising positions, interviewing candidates and attracting graduate students and postdocs. Employees and students require guidance, motivation and encouragement. Inevitably, conflicts arise that must be resolved for the lab to run smoothly; this may even involve firing people. Time swiftly becomes an enormously valuable commodity in the light of additional administrative and teaching loads. In short, a group leader must be a productive research scientist and master all of the skills of a project manager. Few scientists are prepared for this.

"Sure, you're trained to be a good scientist, but that's the least of your worries if you start your own lab," commented Maryrose Franko, Senior Program Officer for Graduate Science Education at the Howard Hughes Medical Institute (HHMI; Chevy Chase, MD, USA). "It's an enormous challenge." Any junior primary investigator has to learn additional skills quickly, as the clock is ticking and the pressure to publish mounts. Unfortunately, the curriculum and work experience of natural scientists does little to prepare them to meet this challenge, unlike their counterparts in business school who take courses in time and project management and team development.

RESOURCES ON LAB MANAGEMENT

Web

www.hhmi.org/grants/office/graduate/labmanagement.html
Compilation of the HHMI/BWF 'Making the Right Moves' course materials, free to download

http://nextwave.sciencemag.org/feature/cdctoolkit.shtml
Science's Next Wave Career Development Center for Postdocs and Junior Faculty offers information on everything from getting a job to managing and teaching

http://recruit.sciencemag.org/feature/advice/advice.shl
ScienceCareer's compilation of articles and advice on scientific careers

www.embo.org/projects/yip/lab_management.html
EMBO Laboratory Management Course

www.umich.edu/~hraa/empserv/deptinfo/empsel.htm
University of Michigan Employment and Executive Services' resource on how to interview and hire people

Books

Barker K (1998) *At the Bench: A Laboratory Navigator*. Cold Spring Harbor, NY, USA: Cold Spring Harbor Laboratory Press

Barker K (2002) *At the Helm: A Laboratory Navigator*. Cold Spring Harbor, NY, USA: Cold Spring Harbor Laboratory Press

Boice R (1992) *The New Faculty Member: Supporting and Fostering Professional Development*. San Francisco, CA, USA: Jossey-Bass

Harmening DM (2003) *Laboratory Management: Principles and Processes*. Upper Saddle River, NJ, USA: Prentice Hall

Portny SE (2000) *Project Management for Dummies*. Hoboken, NJ, USA: John Wiley & Sons

Rosenau MD (1998) *Successful Project Management*, 3rd Edn. Hoboken, NJ, USA: John Wiley & Sons

This is why funding organizations—such as the HHMI and the Burroughs Wellcome Fund (BWF; Research Triangle Park, NC) in the USA, the Medical Research Council in London, UK, and the European Molecular Biology Organization (EMBO; Heidelberg, Germany)—have begun to offer lab-management courses to junior scientists. These courses are designed to help researchers prepare for a life as a group leader and to teach junior investigators how to increase the efficiency of their lab. As Franko explained, the idea arose at combined annual meetings of HHMI and BWF fellows and alumni after focus groups and surveys showed that scientists were particularly interested in acquiring these additional skills. After two years of preparation, Franko and Martin Ionescu-Pioggia, Senior Program Officer for the BWF Career Awards, organized the first full course in 2002, which lasted four and a half days and covered a wide range of topics from developing a mission statement to hiring staff and writing grants. It met a large need: HHMI and BWF received so many requests for more information that they compiled the course material into a book (see Sidebar).

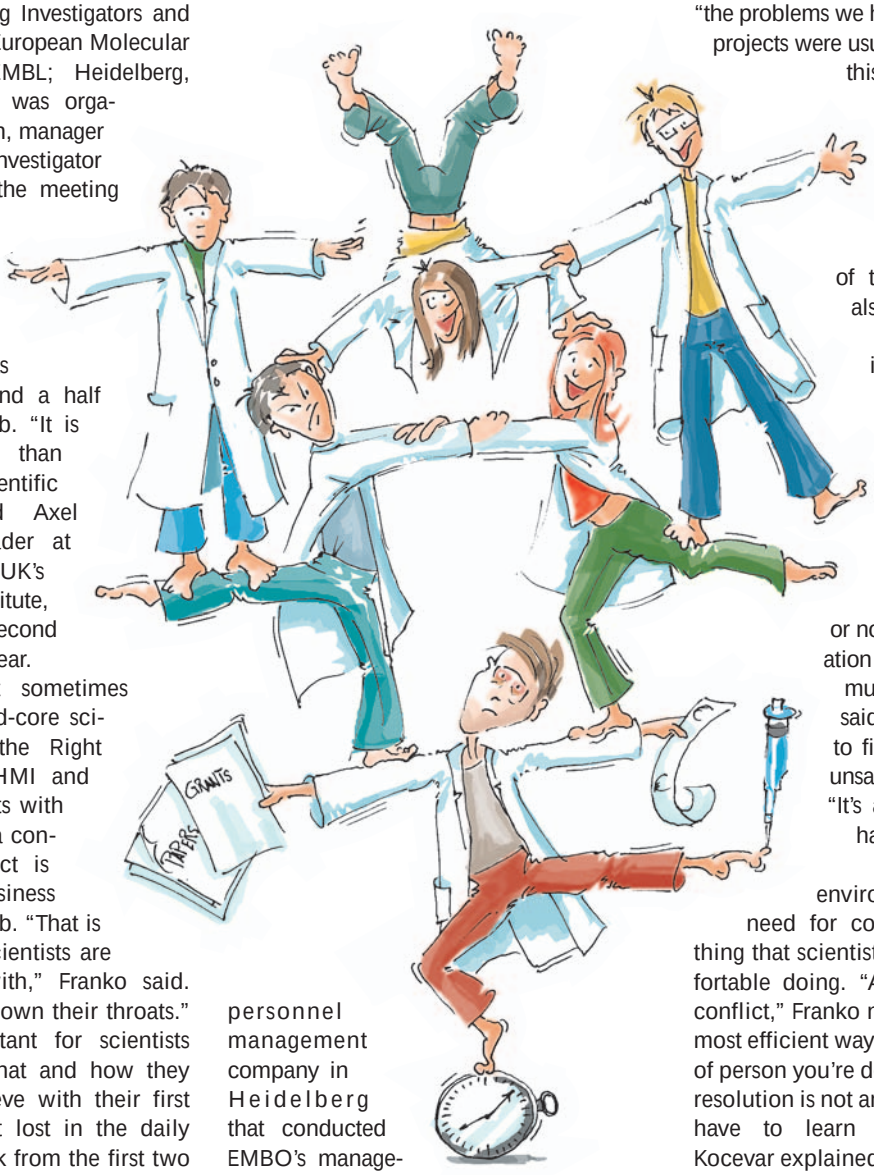
> … a group leader must be a productive research scientist and master all of the skills of a project manager

Junior group leaders are particularly prone to run into conflicts, given the pressures of the job and their lack of experience

EMBO started a similar—albeit shorter and with lower attendance—course in March 2004 with EMBO Young Investigators and group leaders from the European Molecular Biology Laboratory (EMBL; Heidelberg, Germany). The course was organized by Gerlind Wallon, manager of EMBO's Young Investigator Programme. Although the meeting focused only on leadership style, conflict management and interpersonal communication, many of the participants felt it was worth spending two and a half days away from the lab. "It is certainly more helpful than going to another scientific meeting," commented Axel Behrens, a group leader at Cancer Research UK's London Research Institute, who attended the second course in February this year.

The agenda might sometimes sound woolly to a hard-core scientist. The 'Making the Right Moves' course by HHMI and BWF, for example, starts with a 'mission statement', a concept one would expect is more important to a business than a basic research lab. "That is really one thing that scientists are very uncomfortable with," Franko said. "We kind of forced it down their throats." However, it is important for scientists to first think about what and how they actually want to achieve with their first group, before they get lost in the daily grind. And the feedback from the first two management courses showed that a mission statement is valuable. "They felt that this was even more important after they started their lab," Franko said. "If you sit down and first think about your mission, it makes everything else easier." Behrens agreed: "Every lab with a good spirit needs a mission statement," he said. "You can only create a dynamic spirit if you have a common goal."

It also raises the issue of leadership and personality, concepts seemingly more at home in the business world. Nevertheless, it would be wrong to ignore their importance when leading and motivating a research group. "If I prepare people for a career, then these people will have to deal with other people," explained Saso Kocevar, founder and managing director of HFP Consulting, a personnel management company in Heidelberg that conducted EMBO's management course in 2005. "You can reach certain results only as a team. It is wrong to ignore [the importance of leadership]." This was not lost on the participants either. "What we're talking about is management—you're leading a group," said Attila Mocsai, who leads a group of seven people at Semmelweis University in Budapest, Hungary. "It's a good thing to be prepared."



For Kocevar, however, it is even more important to recognize conflicts early and resolve them. "Group leaders share with their team the expectations that they have of themselves," he said. "There is a lot of potential for conflict if these expectations are not clearly spelled out." As Conor John Fitzsimmons, a former mathematician who led the EMBO course together with Kocevar, pointed out, "the problems we had that led us to stopping projects were usually with people." It is for this reason that their course, by contrast with the more holistic HHMI/BWF courses, focuses solely on leadership and conflict solution—not only because of the time limitations, but also because they believe these to be the most important topics. Junior group leaders are particularly prone to run into conflicts, given the pressures of the job and their lack of experience. "It is the question of whether [your first lab] will work or not. And this leads to a situation where you demand too much from your people," said Behrens, who once had to fire a graduate student for unsatisfactory performance. "It's a difficult time until you have achieved something."

In such a high-pressure environment, there is a great need for conflict resolution, something that scientists often do not feel comfortable doing. "A lot of scientists avoid conflict," Franko noted, "and that's not the most efficient way depending on what type of person you're dealing with." But conflict resolution is not an easy skill to teach. "You have to learn conflict management," Kocevar explained. "It is not possible to do this only in theory." HFP Consulting and the HHMI/BWF course thus divide their participants into smaller groups and let them work through difficult situations that typically arise in a research lab. Behrens particularly appreciated these exercises. "I really think that many people realize that they don't have any training in these matters," he said. "In our curriculum we learn nothing about social competence—no

knowledge, no theory." Role-playing games are not, however, to everyone's liking. Jiri Friml, who leads a group of 11 people at the Centre for Plant Molecular Biology at the University of Tübingen, Germany, expected more practical solutions rather than group action, although he positively acknowledged that the course concentrated on the problems and issues that young group leaders typically face.

All of this takes time, of course: managing and caring for people—keeping them happy, as Mocsai put it—writing grants and papers, teaching, and taking care of administrative work all nibble away at valuable time that could be spent at the bench. "All these things were vying for their time and they were spending too much time with management issues," Franko said. Time and project management are therefore increasingly important tools for group leaders who often work at the bench themselves. The HHMI/BWF course gives due space to this topic; in addition to the usual solutions, such as defining priorities or using project management software to organize research, it also aims to teach people how to say 'no' or just to close the office door. Equally important, it stresses improving group members' time-management skills by setting clear goals and deadlines or by simply encouraging them to adhere to fixed agendas and timelines.

Given the demand and the overwhelmingly positive feedback that HHMI/BWF received from course participants—even established scientists expressed interest—it is reasonable to ask whether some of these skills, such as time and project management or conflict resolution, should be taught at the university level. However, "not everyone will be in this situation," Behrens cautioned, so it would make more sense to teach these skills to scientists at the postdoc level rather than spending valuable time earlier in the university curriculum. Similarly, Franko pointed out that their courses focus on those who need these skills most, right before or after they start their first research group. "We've chosen the group we think are the most receptive," she said.

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What is equally clear is that a course here and there is not enough to meet demand. "We had 120 [participants] last time—that's not even a drop in the bucket," Franko said. Furthermore, it is not the responsibility of funding organizations to run such courses, she added, but of the whole academic system. Although she acknowledged that some topics, such as mentoring or conflict resolution, would be best handled by professional teachers, topics such as time management or budgeting could easily be taught by staff from a research institute. This would also make courses even more appealing to young researchers. "We found out from the participants that they want to hear [about these topics] from other scientists," Franko said. "The scientists say the same things but only they can put it into the context of day-to-day experience." To this end, HHMI and BWF are now partnering with academic institutions, learned societies and other funding organizations to start lab management courses at their own institutions. This will involve sharing resources, such as teaching materials or instructors, and learning from each other about what works and what does not.

> …skills such as leadership, social competence and conflict resolution are essential for every successful project leader

But it is probably most important to create awareness among the research community that skills such as leadership, social competence and conflict resolution are essential for every successful project leader. "If we convince these people how important this stuff is, they will hopefully give their postdocs time to take these courses. … It's not that HHMI and BWF do this to make their fellows more competitive," Franko stressed. "Everyone needs this type of training and everyone needs to jump in and share their resources."

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Understanding consciousness

The race is on to decipher the human mind, but it will take time to accommodate the cultural repercussions of this knowledge

In Hanif Kureishi's short novel *The Body*, Adam is a playwright in his sixties who looks back on his life with a fair amount of regret (Kureishi, 2002). Ralph, an admirer of Adam's work, introduces him to an experiment that could offer a new lease of life. With the help of a confident doctor from a dubious but apparently sophisticated clinic, Adam is given the chance to have his mind transferred into the corpse of an unknown man. He simply goes shopping for a new body off the rack, undergoes a mysterious operation at a sterile facility and finds himself in a fresh and younger body that he will inhabit for a six-month trial period. Adam enjoys the immediate consequences of his younger appearance, travels all over Europe, takes pleasure in various adventures and indulges in mindless sexual encounters. For some time, he feels as if he is finally living the life he never had. But Adam soon realizes that changing his body did not give him the privilege of escaping his mind.

> It would be a mistake to claim that consciousness is exclusively an observable behaviour…

The reader does not know whether Adam merely had his brain transplanted into the new body or whether his whole 'self' was somehow wired onto the young