TRAINING SCIENTISTS TO MAKE THE RIGHT MOVES

A Practical Guide to Developing Programs in Scientific Management

Burroughs Wellcome Fund

Howard Hughes Medical Institute

This publication is also available online at *http://www.hhmi.org/labmanagement.*

APPENDIXES

BUDGET PLANNING
Sample Checklist

REVENUE

( ) Institution contribution $_____

( ) Registration fees (X people x $X per person) $_____

( ) Other $_____

Total projected revenue: $_____

EXPENSES

Precourse expenses:

( ) Planning committee travel $_____

( ) Planning committee lodging $_____

( ) Promotional pieces $_____

( ) Office supplies $_____

( ) Clerical assistance $_____

( ) Other $_____

Subtotal: $_____

Evaluation expenses:

( ) Pretraining needs assessment $_____

( ) Posttraining evaluation $_____

( ) Other $_____

Subtotal: $_____

Course venue expenses:

( ) Meeting rooms $_____

( ) Storage room $_____

( ) Sleeping rooms (plus tax) $_____

( ) Audiovisual equipment* $_____

( ) Audio/video recording* $_____

( ) Transcription service $_____

( ) Other $_____

* Include here or budget separately

Subtotal: $_____

Food and entertainment expenses:

( ) Meals* $_____

( ) Refreshment breaks* $_____

( ) Receptions* $_____

( ) Entertainment $_____

( ) Other $_____

*List functions individually

Subtotal: $_____

Speaker and facilitator expenses:

( ) Honoraria $_____

( ) Sleeping rooms $_____

( ) Travel:

    ( ) Airline and train fares $_____

    ( ) Car rentals $_____

    ( ) Taxis $_____

    ( ) Shuttle buses $_____

    ( ) Parking $_____

( ) Other $_____

Subtotal: $_____

Course participant expenses:

( ) Sleeping rooms $_____

( ) Travel:

    ( ) Airline and train fares $_____

    ( ) Car rentals $_____

    ( ) Taxis $_____

    ( ) Shuttle buses $_____

    ( ) Parking $_____

( ) Other $_____

Subtotal: $_____

Staff expenses:

( ) Sleeping rooms $_____

( ) Travel:

      ( ) Airline and train fares $_____

      ( ) Car rentals $_____

      ( ) Taxis $_____

      ( ) Shuttle buses $_____

      ( ) Parking $_____

( ) Resource materials $_____

( ) Shipping of materials $_____

( ) Courier service $_____

( ) Gratuities $_____

( ) Other $_____

Subtotal: $_____

Course notebook, workbook, handouts:*

( ) Binders $_____

( ) Folders $_____

( ) Printing/copying $_____

( ) Other $_____

*Evaluation forms can be included here or
  in a separate budget for evaluation

Subtotal: $_____

Meeting supplies:

( ) Notepads, pens, and pencils $_____

( ) Signage, posters $_____

( ) Nametags, tent cards $_____

( ) Prizes or awards $_____

( ) Other $_____

Subtotal: $_____

Audiovisual equipment:

( ) Sound system $_____

( ) Podium, table microphones $_____

( ) Lavaliere microphone $_____

( ) Projection screen $_____

( ) LCD projector $_____

( ) Laser pointer $_____

( ) Video/audio recording $_____

( ) Overhead projector $_____

( ) Flip charts $_____

( ) Audiovisual technician $_____

( ) Other $_____

Subtotal: $_____

Miscellaneous:

( ) Telephone/fax expenses $_____

( ) Web site development $_____

( ) Childcare $_____

( ) Photographer $_____

( ) Other $_____

Subtotal: $_____

Total projected expenses: $_____

REVENUE LESS EXPENSES $_____

THE BWF-HHMI COURSES IN SCIENTIFIC MANAGEMENT
A Case Study

In 2002 and 2005, the Burroughs Wellcome Fund (BWF) and the Howard Hughes Medical Institute (HHMI) sponsored a course in scientific management for postdoctoral fellows and newly appointed faculty who had received grants from these organizations. Both courses were held at HHMI headquarters in Chevy Chase, Maryland. This case study explains why and how the courses were developed, illustrates the role of evaluation in shaping course content and format, and gives an overview of the sessions at the 2005 course.

A full version of the case study, with session summaries and evaluation outcomes for the 2002 course as well as detailed content outlines and supplementary readings for the 2005 course, can be found in the resources at *http://www.hhmi.org/labmanagement.*

WHY HAVE A COURSE IN SCIENTIFIC MANAGEMENT?

The 2002 course was conceived following discussions between BWF and HHMI staff and scientists who had received research training or career development grants from the two organizations and expressed a need for additional training in laboratory management to successfully launch their research programs. The course received such an enthusiastic response that BWF and HHMI decided to hold a slightly revised version in 2005 that reflected feedback from participants of the first course.

The courses had three goals. First, they aimed to provide participants with laboratory management skills that would help them rapidly establish well-run, productive laboratories. Second, they aimed to provide participants with an opportunity to develop networks with their peers and more established scientists. Third, they sought to point out the need for early career training in laboratory management to universities, professional societies, and postdoctoral associations and provide these institutions with an example of how they might design their own courses in laboratory management.

To better accomplish the third goal, as part of the development of the 2005 course, BWF and HHMI established the Partners in Scientific Management Program. In this program, academic institutions and professional societies interested in improving the training of early-career scientists were invited to apply to help plan the 2005 course and attend and critique the course itself. In exchange, applicants committed to carrying out scientific management events suitable for their own constituencies. The organizations that were selected to participate in the Partners Program are listed on page xiii.

IDENTIFYING TOPICS FOR THE 2002 COURSE

The 2002 course was developed over a two-and-a-half-year period by staff from BWF and HHMI, with assistance from the American Association for the Advancement of Science (AAAS). The first year was spent identifying the topics to be covered. The course developers convened two focus groups mainly composed of BWF and HHMI grant recipients, including advanced postdocs and newly appointed faculty and physician and nonphysician scientists, that identified a diverse range of career development needs that coalesced under the general theme of scientific management. To further refine the list of topics, the course developers consulted with senior scientists and professionals affiliated with BWF and HHMI.

Because of the limited time frame of the course, it was decided that certain important topics, such as lab safety, would not be covered. Course developers and focus group participants felt that this information was either taught at most universities or was available from other sources. The course developers eventually narrowed down the list of potential session topics to 14, which they thought could be covered adequately within the projected three-and-a-half-day time frame of the course. These topics were

- ❖ Laboratory leadership
- ❖ Project management
- ❖ Collaborations
- ❖ The scientific investigator within the university structure
- ❖ Getting funded
- ❖ Getting published
- ❖ Current issues in research ethics
- ❖ Time management
- ❖ Data management and laboratory notebooks
- ❖ Mentoring and being mentored
- ❖ Gender issues in the laboratory
- ❖ Technology transfer
- ❖ Obtaining and negotiating a faculty position
- ❖ Budgets and budgeting

THE 2002 COURSE EVALUATION: PROCESS AND OUTCOMES

The 2002 course participants completed an evaluation at the end of each session and an overall evaluation at the end of the course. Completed forms were collected as participants left the session rooms. The evaluations were anonymous—responses were associated with the participant's badge number on the evaluation form. The number was then linked to the participant's demographic information (e.g., academic level, degree) but not to his or her name. Additional feedback was obtained from a focus group held with several course participants directly after the course ended. Evaluations at six months and at one year were conducted to determine which components of the course had been useful to participants.

The following six sessions (in alphabetical order) received the highest ratings:

❖ "Getting Funded"

❖ "Mentoring and Being Mentored"

❖ "Obtaining and Negotiating a Faculty Position"

❖ "Roundtable Discussion of Problems in Scientific Management"

❖ "Time Management"

❖ "Workshop in Basic Laboratory Leadership Skills"

Note: In the one-year evaluation, course participants rated the "Project Management" session higher in terms of value than they did at the time of the course.

Many participants liked that the course was held as a "retreat" rather than at a university or some other setting where it would be more difficult to focus on the course content and take advantage of the networking opportunities. One individual would not have been comfortable discussing a laboratory management problem if the course had been offered at the home university because of the lack of anonymity in such a setting.

Many respondents commented that one of the most valuable parts of the course was the question-and-answer (Q&A) period at the end of each session. This part of the session was sometimes considered more valuable than the structured presentations. Many respondents also felt that the networking opportunities during the breaks and meals were very important and would like to have had even more such opportunities (including a more purely social event). The most popular format for the sessions was the small breakout group—talking to each other about shared lab management problems, often with the participation of a senior scientist, was more useful than listening to panel presentations. Many participants also noted that the most useful panels included background information provided by the presenters, followed by case study examples. Having a diverse panel in terms of age, faculty position, and scientific discipline was also thought to be useful.

For more about the 2002 BWF-HHMI course sessions and evaluation outcomes, see the full version of the case study at *http://www.hhmi.org/labmanagement*.

USING THE 2002 COURSE EVALUATION TO IDENTIFY TOPICS FOR THE 2005 COURSE

The evaluation outcomes from the 2002 course were crucial in shaping the format and content of the 2005 course. Some sessions were dropped, others were presented in a slightly different format, and some new sessions were added. For example, the following sessions were added to the 2005 course:

- ❖ "Teaching and Course Design"

- ❖ "Strategies for Success for Basic Scientists"

- ❖ "Strategies for Success for Physician-Scientists"

- ❖ "Mock Study Section"

On the other hand, "Technology Transfer," "Current Issues in Research Ethics," and "Getting Published" were not offered in 2005 because participants would be able to obtain information about technology transfer and research ethics at their institutions and many were already experienced with the process of publishing their research. Although the course organizers thought sessions on these topics would be useful, other topics seemed to represent a more pressing need for the BWF-HHMI course participants. The sessions "Data Management and Laboratory Notebooks" and "Budgets and Budgeting" also were not offered, although aspects of these topics were included in the reconfigured sessions on project planning and getting funded. The topic of negotiating a faculty position (paired with the topic of securing a faculty position at the 2002 course) was not addressed in 2005 because this group of participants had already secured their faculty appointments (see page 103, "Speakers and Participants," for more on the criteria used for selecting participants in the 2005 course).

The following is a list of topics that were included the 2005 course:

- ❖ Laboratory leadership and management in science

- ❖ How to navigate the university structure

- ❖ Securing tenure

- ❖ Project planning

- ❖ Time management

- ❖ Mentoring and being mentored

- ❖ Collaborations

- ❖ Gender issues ("Sex and Science")

- ❖ Teaching and course design

- ❖ Strategies for success for basic scientists

❖ Strategies for success for physician-scientists

❖ Getting funded and budgets

❖ Mock study section

❖ Problems and solutions in scientific management

See page 105 for an overview of the sessions at the 2005 course and feedback from participants.

ORGANIZING THE 2002 AND 2005 COURSE SESSIONS

Once the course topics had been chosen, the next step was to develop the topics into sessions. This process was roughly the same for both courses. The session organizers researched the topics, determined the amount of time needed to address each topic and the format to be used, identified and contacted potential speakers, worked with confirmed speakers to develop the presentations, and organized the background materials for the course notebook. The course coordinator—a third-party consultant paid by both organizations—set the final course agenda, sent out invitations to speakers and participants, and tracked the responses.

In 2002, the six session organizers developed their sessions independently (e.g., selecting speakers and working with them to shape session content) and reported directly to the course organizer. For the 2005 course, session organizers had the same responsibilities that they had for the 2002 course, but the structure for managing the course overall was modified a bit. Three people—the course coordinator and the HHMI and BWF course codirectors—now had principal responsibility for managing the development of the course. The course coordinator assigned sessions to the course codirectors who, in turn, oversaw the work of the session organizers. Managing oversight in this way enabled decisions to be made more quickly, ensured more consistency across the sessions, and reduced the potential for overlapping content.

For each course, the preparation time for materials, speaker invitations, presentations, and the course notebook (see page 104, "Course Materials") was about 10 months.

Speakers and Participants

Both courses were taught by scientists and other professionals from academia and industry. Participants were limited to current and former BWF and HHMI grant recipients, who were selected on the basis of the stage they had reached in their scientific careers and diversity in terms of gender, geographic location, type of academic institution, and degree (i.e., Ph.D., M.D., M.D./Ph.D.). The 128 participants at the 2002 course were biomedical research scientists who had recently received their first academic appointment or were postdoctoral fellows looking for an appointment. The 100 participants at the 2005 course were farther along in their careers—

advanced postdoctoral fellows (individuals who had accepted, but not yet begun, a faculty position) and new faculty (individuals within one to two years of starting their faculty appointments). The decision to target this more advanced group was the result of feedback from the 2002 course in which early-stage postdoctoral fellows noted that they were not yet ready to take full advantage of sessions that focused on more advanced career development and managerial topics, such as preparing for tenure and laboratory leadership.

Cost per Participant

The actual cost per participant is difficult to calculate because HHMI lent much of its infrastructure to the course and most development costs were included in staff salaries or in time donated by speakers. However, not counting these costs, the amount for the 2002 course was approximately $2,800 per participant; the amount for the 2005 course was approximately $2,000 per participant. These costs were paid for by the sponsors. Most of these amounts can be attributed to travel, meals, lodging for participants and speakers, and speaker honoraria. A similar course conducted for on-site participants at a university would cost significantly less.

Course Materials

At both courses, participants were given a course notebook—a large three-ring binder containing summaries of the sessions and learning objectives, outlines of the session presentations, and reference lists. The notebook also contained exercises that were to be completed during or after some of the sessions. For sessions where participants were to be split into smaller groups, the notebook contained lists of participants in each group. The notebook was organized into sections for each day of the course. Participants were asked to bring the notebook with them to each session, or at least each day's material. A map of the conference center and a course schedule were included in the front pocket of the notebook.

Course participants were asked to read the materials for each session ahead of time to familiarize themselves with the session content and logistics. This was particularly important for sessions in the 2005 course that had a somewhat unusual format, such as "Laboratory Leadership and Management in Science" and its small-group sessions.

In addition to the session-specific material, the course notebook contained copies of articles on topics that were not covered in the course, such as scientific publishing and equipping a lab.

In addition to the course notebook, participants were also given an opportunity to view samples of the following resources:

❖ Barker, Kathy. *At the Helm: A Laboratory Navigator*. Cold Spring Harbor, NY: Cold Spring Harbor Laboratory Press, 2002.

❖ Howard Hughes Medical Institute. Videos on laboratory safety (available at no charge at *http://catalog.hhmi.org*).

❖ Kanare, Howard M. *Writing the Laboratory Notebook*. Washington, DC: American Chemical Society, 1985.

❖ Medawar, Peter B. *Advice to a Young Scientist*. New York, NY: Harper & Row, 1979.

❖ Portny, Stanley E. *Project Management for Dummies*. New York, NY: Hungry Minds, 2001.

❖ Reis, Richard M. *Tomorrow's Professor: Preparing for an Academic Career in Science and Engineering*. New York, NY: IEEE Press, 1997.

SESSION FORMATS: 2002 AND 2005 COURSES

Course topics were presented in four formats: workshop, panel discussion, roundtable discussion, and single-speaker or keynote address. Some sessions of interest to particular subgroups of participants were offered concurrently. Each session concluded with time for Q&A. The courses also included opportunities for participants to informally network with their peers, the speakers, and senior scientists and staff from BWF and HHMI. As a result of the 2002 course evaluation, the 2005 course included even more time for Q&A in the sessions and provided participants with more opportunities for informal interaction, including more free evenings.

SESSION SUMMARIES: 2002 SESSIONS REVISED FOR THE 2005 COURSE

Both the 2002 and 2005 courses began with an evening reception and welcome and keynote addresses by the senior staff of BWF and HHMI. (Excerpts of the 2002 course keynote by HHMI president and Nobel laureate Thomas R. Cech can be found at *http://www.hhmi.org/labmanagement*.) The courses continued over the next three-and-a-half days, with a full schedule of back-to-back sessions (see appendix 3 for the 2005 course schedule).

Collaborations

The 2002 and 2005 courses both included sessions that explored the benefits, challenges, and limitations of collaborative research as well as the practical issues of establishing collaborations across sectors and among researchers in disparate fields. In 2002, the format was a single one-and-a-half-hour panel session that consisted of 10-minute panel presentations by three senior scientists, representing academia and industry, followed by a Q&A period. In the 2005 course, the length and format of the session remained the same. However, the session was held twice, concurrently with the two "Mentoring and Being Mentored" sessions, so that participants could attend each and benefit from the added interaction afforded by a small group (participants were split into two groups, alphabetically by last name: "A–L" and "M–Z"). Speakers at the 2005 course talked about the rewards and risks of collaboration and, in response to feedback from the 2002

course, talked about how beginning scientists can approach someone about starting a collaboration as well as the risks and benefits of sharing work, responsibility, and credit.

In the 2005 course evaluation, respondents thought that the most useful topics were authorship issues, balancing collaborations with independent research, tips on what makes a collaboration work and what doesn't, how to distinguish between help and a collaboration, how to say no to projects, and the pitfalls of collaboration time commitment with respect to getting ready for tenure review. Several participants commented that, although it was interesting to hear about different paths to successful collaborations, they would have preferred less "personal storytelling" and more time for either Q&A or discussion of a case study. They also noted that they preferred the presentations that dealt with the small-scale collaborations in which junior faculty are usually involved. Participants wanted to learn more about how to initiate a collaboration, how to negotiate authorship, and how to work with senior-level collaborators. Others wanted more discussion about the roles of physician-scientists and basic scientists in a collaboration.

Gender Issues in the Laboratory

The topic of gender issues was included in the 2005 course in the form of a one-hour lecture, titled "Sex and Science." Topics included working with women in science and being a woman in science. Research was presented on why women are poorly represented in the leadership of science. Following the lecture, participants were presented with two case studies to work through with a facilitator over lunch. Participants were asked to discuss what they would do as women faculty members and as colleagues.

Feedback from the 2005 course evaluation indicated that this session was well received by participants. In particular, they valued the discussion of the case-study exercise, which revealed the presence of unintentional gender bias using the examples of letters of recommendation. They also liked the non-confrontational nature of the speaker's presentation and her use of data in documenting bias. Participants wanted more information on how to address bias in themselves and in others. They also wanted more discussion of minority issues and how to handle sexual harassment. They wanted more case studies with real-life examples and solutions. Several participants suggested having a panel format instead of a single speaker or having a panel discussion at the end of the lecture to discuss topics raised in the lecture.

Getting Funded

This topic was covered in the 2002 and 2005 courses in two-hour sessions that used much the same format: Twenty-minute presentations by three speakers, followed by a Q&A period. In 2005, the session was taught by representatives from the National Institutes of Health (NIH), the National Science Foundation (NSF), and a senior academic scientist. They focused their presentations toward beginning investigators who are writing their first grant proposals. The session also included information about basic budgeting principles, such as what constitutes a reasonable budget, direct versus indirect costs, managing salaries across grants, equipment ownership, and tracking expenditures to manage current funding and prepare for the next grant cycle.

This was a very popular session. Participants particularly valued the tips on writing a grant proposal and information about NIH small-grant opportunities. Many appreciated learning more about the roles of NIH staff and the types of grants offered, as well as the process and timelines for NIH grant reviews. Participants would have liked greater clarity about the differences between NSF and NIH funding goals and grant application processes, as well as how to choose a study section and an institute appropriate for the project. Some participants wanted to know about funding sources other than NSF and NIH, such as foundations. Others wanted more information about balancing a budget, keeping track of expenses, and making the most of start-up funds. Many wanted to see a real sample budget, with in-depth recommendations on percent allocations to each category of labor, equipment, and supplies. Several participants mentioned that they would have liked the session to be held at the beginning of the course so they could have time to discuss the session topics more fully during meals and the course's social gatherings. Several participants noted that they would have preferred shorter speaker presentations and more time for Q&A.

Laboratory Leadership Skills

The first session at both the 2002 and 2005 courses dealt with the topic of laboratory leadership. Because interpersonal skills are among the most difficult to teach effectively and the most important in managing a laboratory, the course organizers allotted the largest amount of time to this session. In both courses, the sessions were facilitated by career development professionals.

In 2005, the session began with a one-hour lecture on the first night of the course that provided an overview of what leadership means in the scientific community and illustrated the distinction between management and leadership. The lecture set the stage for the small-group modules that would be conducted the next day. For these modules, participants were divided into five groups of 20 participants; each group met in a different room with a different facilitator. (A list of participants and their assigned groups was included in the course notebook.) Three weeks before the course, participants were asked to complete two personality inventories: the Meyers-Briggs and Skillscope. Participants were given the results of these assessments in their small groups and used the results to identify the skills they needed to improve to become more effective leaders and practiced these skills. The session was well received by participants. One noted that the session was an "eye-opener." Many commented that they found the exercises to be more practical than expected and that it was helpful to explore interpersonal issues in depth. Some participants would have liked more exercises to practice solutions to common lab problems and problems encountered with outside collaborators and scientific competitors.

Mentoring and Being Mentored

For the 2005 course, the session was offered twice, concurrently with the two "Collaborations" sessions, so that participants could attend each and benefit from the added interaction afforded by a small group (participants were split into two groups, alphabetically by last name: "A–L" and "M–Z"). The 90-minute sessions consisted of a panel discussion with two speakers (a

third speaker could not attend because of illness)—a senior scientist and a junior faculty member. The speakers each gave a 20-minute presentation, followed by a Q&A period. Speakers were asked to discuss the following topics:

❖ How can I be a better mentor?

❖ How can I get mentoring for myself?

❖ How can I encourage members of my lab to mentor one another?

While feedback to the 2005 session was generally positive, many participants thought the time allowed was insufficient. Participants also wanted more case-study examples of mentoring situations and of common mistakes and their solutions. They suggested a better format might have involved discussing case studies in small groups and then reconvening to discuss outcomes with senior-level faculty mentors. Other participants wanted advice on how to maintain personal boundaries when a young investigator is mentoring a postdoc who is close in age and how to distinguish between mentoring and micromanaging. Yet another participant wanted more discussion on writing letters of reference. Another suggestion was to divide the session according to topics such as "mentoring others," "finding a mentor," and "being mentored," with specific guidelines and case studies for each topic.

Project Management

The 2005 course session focused on the concepts of project planning that are most useful to running a new laboratory but with some discussion of large collaborative projects in a clinical setting. The session comprised two parts. The first part was a plenary session consisting of 45-minute presentations by two speakers, both of whom were practicing scientists at the same institution, followed by 30 minutes of Q&A. Speakers introduced participants to the basic concepts of project planning (i.e., defining project outcomes, clarifying project authority, developing schedules, assessing and managing risks, and maintaining control), with a focus on ones most useful to early-career scientists to effectively run a new laboratory.

Part two of the session was a small-group exercise. At the end of the lecture session, teams of 8 to 10 randomly assembled participants were given a case study, presented as a game, to solve over lunch (the case study can be found in the resources at *http://www.hhmi.org/labmanagement*). The teams were given a set of objectives, a budget, and a list from which to choose staff members and collaborators. Each team was then scored on the basis of the completed objectives and the effective use of funds.

Participant feedback on the session was positive, although many participants thought that the large-scale collaboration discussion was of little value to the beginning investigator. The most useful topics covered in the session included allocation of resources and project plan execution, time management, and project planning software. Some participants wanted to know

more about how to build the training of technician staff into project planning and how to motivate postdocs to adopt project-planning strategies. Others wanted to know, given the limited resources of junior faculty, how to prioritize projects.

Many participants felt that the plenary portion of the session was too long and more time should have been set aside for the case study or for Q&A. Some participants thought it would have been more valuable if the speakers had been from different institutions. Participants reacted positively to the case-study portion of the session, but several said they would have preferred a more structured setting and time frame for this exercise, instead of having it over lunch, so that participants could be sure of completing the exercise.

Roundtable Discussion: Problems and Solutions in Scientific Management

The 2002 and 2005 courses both featured a session in which participants discussed case studies that represented common situations encountered by beginning academic scientists. The session was included as a way to tie together all the issues discussed during the course and to provide participants with an opportunity to use what they had learned in the course to develop solutions to lab management problems. The session was offered on the last day of the course after participants had the benefit of attending all the sessions and could use their newly acquired knowledge to address the issues.

Before both courses, participants were asked to submit summaries of problems they had encountered in their labs. BWF and HHMI staff then selected 10 cases that were representative of the topics covered in the course and career situations of course participants. Cases were submitted anonymously, and the situations and characters in the cases were modified by the course coordinator to preserve participant anonymity. Participants met in the conference center auditorium for an introduction to the session. Then participants were assigned to small groups, each including one or more senior scientists from the course, to discuss the case studies.

The discussions of the case studies were handled differently in the 2002 and 2005 courses. In their evaluations of the 2002 course, participants noted that they did not find the reporting back of solutions to be useful; the most valuable aspect of the session was the small-group discussion.

For the 2005 course, the format was fine-tuned to reflect this feedback. Participants were asked to review the case studies before the course and keep them in mind throughout the relevant sessions of the course. After participants met in the conference center auditorium for the introduction to the session, they moved to different locations to join their preassigned discussion group. Each group was given three or four of the case studies to discuss over a two-hour period. A moderator, chosen from the course speakers, led the discussions and provided a senior scientist's perspective.

The session generated positive feedback from participants. Small-group, in-depth discussion of a few cases was considered by several participants to be the ideal format for this topic. Several participants said they would have liked even more time for this exercise to incorporate the skills they had learned during the course, and they suggested that the entire last day of the course be devoted to small breakout sessions to discuss the lessons learned in relation to case studies.

The Scientific Investigator Within the University Structure

The 2005 course session on university structure consisted of a 45-minute presentation by a senior scientist/administrator, followed by a 15-minute Q&A period. In addition to talking about many of the topics covered in the 2002 course, the speaker also discussed the organization of a typical medical center, individuals who can help advance a new investigator's career, research infrastructure (including the topics of direct and indirect costs), and the expectations for the beginning investigator outside the laboratory (e.g., committee service, teaching, advising).

Participant feedback to the session was mixed, although the majority of participants thought the information was useful. Of particular interest was the discussion on clinical revenue stream versus the research stream, how to balance scholarship and service, and how to build relationships with key people. Participants wanted to know more about when and how to build a relationship with a dean. More information on how to handle joint appointments across university schools (e.g., arts and sciences and medicine) would have been appreciated. Some participants thought that less time should have been spent on covering the information related to academic health centers, as that topic could have been discussed in the session specifically held for physician-scientists. It was suggested that course developers poll their target audience to better determine the type of institution on which to focus. Participants said they thought that this subject might be better suited to a panel format with speakers representing university-wide and school-level entities and different levels of administrative governance (e.g., dean, department head) and faculty points of view.

Time Management

Both the 2002 and 2005 courses offered a two-hour panel session on this topic. The format consisted of 15-minute presentations by three panelists (a mix of senior and junior faculty), followed by a Q&A period. The sessions focused on various aspects of time management in a laboratory setting: managing day-to-day activities efficiently; prioritizing demands according to goals; long-term planning for professional growth; and managing the concurrent demands of teaching, administrative duties, and family responsibilities. As in 2002, basic scientists and physician-scientists attended the 2005 session; time-management issues particularly germane to basic scientists and physician-scientists were addressed in a special session for each group.

As in the 2002 course, this was one of the most popular sessions. Participants particularly appreciated tips on how to motivate and manage without micromanaging, how to set priorities, how to provide constructive feedback, and how to manage the grant-writing process. They also liked the

balance between younger and older panelists and professional levels. Participants said they would have liked to hear about how to deal with burnout and how to engage others to help save time. They also wanted recommendations on software and other tools, as well as more practical examples for time management. Although participants appreciated the discussion of personal time management as well as lab time management, several thought that too much time was spent on the topic of young children and on other family issues that were of limited concern to participants who did not have spouses and children.

SESSION SUMMARIES: NEW SESSIONS DEVELOPED FOR THE 2005 COURSE

From information provided in the 2002 course evaluations, course organizers decided to develop several new sessions.

Mock Study Section

This evening session was optional. The format consisted of a skit by several scientists who played the roles of administrators and reviewers in an NIH study section reviewing an NIH R01 application and an NIH K award application. One good and one poor application were reviewed. This was followed by a Q&A segment. The session was extremely popular; participants found the session both entertaining and informative. Participants found it helped demystify the study section process. Of particular interest was finding out how quickly decisions are made and, consequently, the importance of presenting ideas clearly and succinctly in the grant proposal. Several participants recommended that grant proposals be handed out to course participants ahead of time so that they could judge the grants themselves and then compare their responses to the mock reviewers'. It was also suggested that an additional R01 grant proposal be used as an example instead of the K award proposal, because many of the participants already had a K award. Several participants thought the session could be longer and requested more time for Q&A.

Securing Tenure

In response to feedback from the 2002 course, this topic was developed into a separate session at the 2005 course to help course participants, who had already secured faculty positions. The format consisted of 15-minute presentations by three panelists, followed by 45 minutes of Q&A. The panel comprised two faculty (an assistant professor and an associate professor) representing a research university and a medical center and a senior scientist at a research university. The session addressed the following issues: tenure in today's environment, the process and criteria for achieving tenure, and pitfalls to avoid along the way. Topics included the tenure review process and expectations for promotion, what to do and when, building a national reputation, developing the dossier, and special tenure-related issues of concern for physician-scientists and women.

This was a popular session. Especially appreciated were the details about the tenure process and what is most important—and less important—for

achieving tenure and how to prepare and add documents to the tenure portfolio. Participants also appreciated getting the perspectives of speakers at different career stages; the perspective of someone who had just completed the tenure process was thought to be more valuable than the perspective of someone currently going through it. The discussion on maternity leave was also considered valuable, although one participant commented that the subject might have been better covered by a dean or department chair rather than someone "going through it." Participants wanted to know more about several issues, including how tenure letters are evaluated and scored, how to handle a shortened tenure clock, and the impact of clinical service on promotion and tenure. It was suggested that a sample tenure dossier be included in course materials. Also requested was a case study on someone who failed to achieve tenure, and an analysis of why this occurred and what recourse options the denied applicant might face.

Teaching and Course Design

This session was added because an academic appointment often includes a teaching component for which new faculty are often unprepared. Participants from the 2002 course recognized this fact, citing this topic as one that should be covered in future courses. The session consisted of a panel with three speakers representing a large research university, a small liberal arts college, and a medical school. Each speaker gave a 30-minute presentation, followed by 30 minutes of Q&A. Speakers introduced participants to some effective tools, including active-learning techniques, to use in their classes. The following topics were covered:

❖ Teaching at a large research-oriented university

❖ Teaching at a medical school

❖ Teaching at a liberal arts college or university

❖ Balancing the demands of research, teaching, and service

Although participants at the 2002 course noted that a session on teaching would be useful, the 2005 course evaluation revealed that many participants found it to be of little relevance to their roles as scientific managers. Others said they did not need some of the information—such as that on course development—at this time. Still others felt there was insufficient time to cover the three types of teaching (liberal arts college, research university, medical school). The most frequent suggestion was to omit the topic of teaching at a liberal arts college and reduce the time spent on the topic of teaching at a medical school. Participants recommended splitting the session into three groups to address each topic in greater depth. Participants found the theory behind active learning to be useful. They wanted more clarification on the difference between teaching in the lecture setting and the one-on-one teaching that occurs with postdocs and graduate students. They also wanted more information on active-learning techniques, designing exam questions, leading a discussion, and grading and handling grade-related complaints. They also wanted more discussion of how to be rewarded professionally for good teaching.

Two Sessions for Two Distinct Groups: Basic Scientists and Physician-Scientists

Two sessions were targeted to two distinct groups: basic scientists and physician-scientists. The decision to develop these two new sessions was a direct outcome of the 2002 evaluation, in which many participants who were conducting basic research thought that too much time was being devoted to the challenges faced by the physician-scientist. Although the course organizers recognized the benefit of familiarizing each group with the other's issues, they also decided that there would be significant benefit to hold concurrent sessions for each group.

Strategies for Success for Basic Scientists. This session consisted of a 90-minute panel discussion with three senior basic scientists, each giving a 10-minute presentation, followed by open discussion with the audience. Success for new basic scientists in an academic department is often defined in terms of achieving tenure. Panelists provided some advice on key issues for tenure-track basic scientists: securing and maintaining funding, obtaining peer recognition, publishing, maintaining a productive laboratory, teaching effectively, and fitting in with their respective departments. The session was rated highly by participants. These participants particularly liked the tips on funding, working with editors, managing conflict in the lab, and setting expectations for lab members. Participants noted that they would have liked to learn more about funding opportunities; how a basic scientist should navigate the terrain within a medical school (especially if there are clinicians on the tenure committee; and how to recruit and select graduate students, postdocs, and technicians.

One participant suggested the following: Have the speakers address the following statement: Give us your favorite three insider tricks. Also have them answer the following questions: What took you years to figure out? What do you do that no one else does?

Strategies for Success for Physician-Scientists. This session consisted of a 90-minute panel discussion with four senior physician-scientists, each giving a 10-minute presentation, followed by open discussion with the audience. Panelists provided some advice on issues of concern to physician-scientists, including negotiating for and retaining protected research time, understanding how to approach tenure review by managing tenure and research, and building a clinical base that is aligned with research efforts. The session was rated highly by participants.

The participants particularly liked the "10 rules for success" that were outlined by one of the speakers, the discussion on finding a balance between practical and speculative research, and the advice on the importance of finding a clinical base for individual research projects. The discussions about whether to look for a position in a clinical versus basic department were also valued highly.

Participants would have liked more discussion about how to develop a strong basic science research program in a clinical department, how to improve time management skills, and how to address the burnout associated with having a demanding schedule. One person suggested that future speakers address the following two issues specifically: What are the 10 most common problems that a physician-scientist will encounter? How should a physician-scientist deal with these problems?

THE 2005 COURSE EVALUATION: PROCESS AND OUTCOMES

The method for evaluating the 2005 course was generally similar to that for the 2002 course. Participants completed an evaluation for each session as well as for the entire course. However, no postcourse focus group with participants was held. Instead, course organizers obtained feedback from representatives of the organizations in the Partners in Scientific Management Program, who met several times during the course with course organizers to share their observations about course format and content.

Results from the evaluation completed by participants immediately after the 2005 course are presented below. (Because BWF and HHMI do not intend to hold the course again, evaluations at six months and at one year are not planned.)

Overall Impressions of the Course

Ninety-one of the 100 participants in the 2005 course completed the overall course evaluation. The course was very well received by participants; more than 90 percent of respondents considered the overall quality of the course content, the relevance to their roles as scientific managers, and the opportunities for networking as "excellent" or "very good." More than 90 percent of participants who had labs said they expected to change the way they manage their labs. One participant, for example, noted "[the course] has motivated me to think about how I manage, instead of just letting things happen." Other participants reported feeling more confident and prepared as a result of attending the course. Postdoctoral-level participants considered themselves more likely to use the course information than participants who were junior faculty; M.D.s reported a greater intention to use the course information than did M.D./Ph.D. or Ph.D. participants. Ninety-seven percent of respondents said they would recommend the course to colleagues. When asked to identify the single most important component of the course, participants mentioned the following:

❖ Advice and perspectives of senior investigators combined with the experience of outside consultants

❖ Opportunity to talk with and hear from others in the same situation

❖ Opportunity to learn strategies for lab leadership and management in a formal way and gain insights into personality types and methods for developing lab workers

The mock study section and project planning session were also mentioned as important aspects of the course.

The following, in order of popularity, are the eight most popular sessions, which included lectures, panels, and small-group discussions:

- ❖ "Mock Study Section"

- ❖ "Getting Funded and Budgets"

- ❖ "Time Management"

- ❖ "Laboratory Leadership and Management in Science"

- ❖ "Securing Tenure"

- ❖ "Problems and Solutions in Scientific Management"

- ❖ "Strategies for Basic Scientists"

- ❖ "Strategies for Physician-Scientists"

Overall Course Length

Approximately 70 percent felt that the course length was appropriate, although a large number (28 percent) thought it was too long. Both the 2002 and 2005 courses had relatively grueling schedules, with participants involved in sessions from early in the morning until sometimes late in the evening. However, because of the difficulties of arranging schedules and travel and the perceived lack of time on the part of the participants for anything outside of research pursuits, in both cases it was decided to deliver the course in one intensive retreatlike session. Future course organizers who do not have the option to provide a retreat environment may choose to break up the course sessions over several months, either as brown bag lunches or in two- to three-hour sessions.

Improving the Course

Participants had the following suggestions for improving the course:

- ❖ Have a panel of senior scientists discuss specific problems they have encountered, the strategies they used to solve the problems, and what they might do differently.

- ❖ Include a full session on conflict management.

- ❖ Add the topics of budget/purchasing, hiring and firing people in the lab, writing a letter of recommendation, and how to handle oneself professionally (e.g., maintaining a professional distance from lab members, avoiding offending colleagues and lab members).

- ❖ Provide even more diversity in presenters to underscore the notion that there are many management styles that can lead to success and failure.

- ❖ Cover the subject of teaching in greater depth instead of a cursory way; if this is not possible, use the time for other topics.

LESSONS LEARNED FROM THE BWF-HHMI COURSES IN SCIENTIFIC MANAGEMENT

The lessons learned from the two courses can be categorized into four different subjects: preparation, format, content, and logistics.

Preparation

In terms of preparing the participants before their arrival at the course, course organizers should consider providing, when possible, readings and other materials in advance so that more time can be spent on questions, discussions, and other activities. This can be accomplished by setting up a Web page with PDF files for downloading. Organizers should also consider asking the participants when they register what issues are of significant interest to them, and specifically raise some of these issues in the course discussion sessions to reflect the participants' pressing concerns. The more the course is tailored to the participants' perceived needs, the better they will internalize the materials.

Format

Throughout the evaluations, from both courses, the participants stressed that they got the most information from the Q&A periods that followed the presentations. As such, future organizers could consider having speakers provide shorter introductions to each session and leave more time for discussion. As learned in the "Teaching and Course Design" session, active-learning exercises are popular. Course organizers should try to involve the participants as much as possible in small discussion groups, breakout sessions, and role-playing activities whenever possible.

A divide has always existed between basic and clinical scientists. While joint sessions are valuable so that each group can better understand the challenges faced by the other group, in the 2005 course, having specific sessions for each group was very well received.

One course participant suggested having small moderated discussion groups that meet once or twice a day to reflect on the large-group sessions. While this would add more time to the course, it could also significantly improve the networking opportunities, especially if the groups consisted of different individuals each night and were organized by either stage of career, basic or clinical research focus, or geographical distribution.

Several participants recommended considering reserving the last day for discussion only—perhaps expanding the "Problems and Solutions in Scientific Management" session, in which speakers and panelists join the participants in small groups to discuss case studies.

In both courses, participants recognized the value of having a chance to rub shoulders with senior principal investigators (PIs)—in terms of networking opportunities and the advice that could be derived from more "seasoned" PIs. Course organizers should consider having senior PIs attend the course and interact with the participants informally as much as possible.
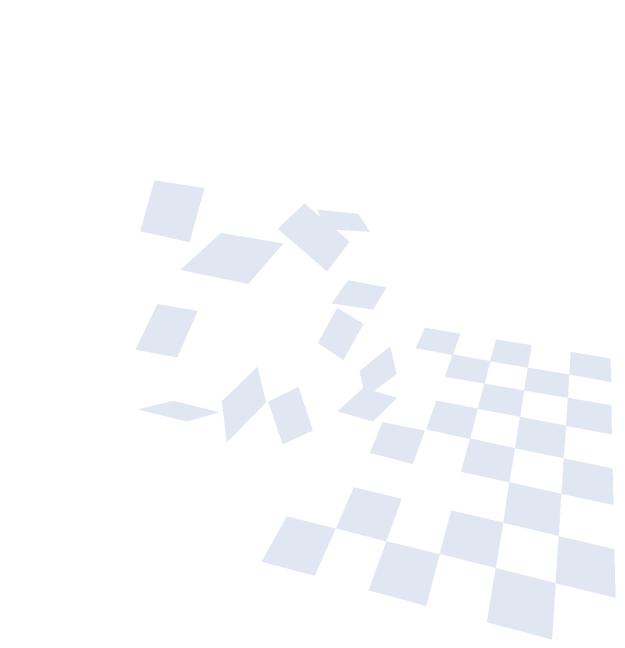
Content

Often there is resistance in the scientific community to personality inventories and leadership assessments like the Myers-Briggs and Skillscope tools. Feedback from the 2002 and 2005 course participants indicated that the insights gained from these assessments proved valuable when participants returned to their labs. To ensure that participants get the most out of what these tools can offer, training organizers should take great care to explore the results using exercises that reflect the language and everyday concerns of research scientists.

After preparing two courses, and developing several new sessions for the second course, there are few topics that have not been covered to some extent. Three areas were identified by participants in the second course as still needing to be addressed, however. Future course organizers might consider adding sessions devoted to conflict resolution, staffing a laboratory, and writing letters of recommendation.

Logistics

The schedule was demanding and was especially difficult for individuals from the West Coast who faced a three-hour time change. When planning a national course, the organizers might consider starting the morning sessions later or moving the conference/retreat location to another time zone (Mountain or Central).

The two courses each took approximately three-and-a half-days plus travel time, or between four and four-and-a-half days for each course. Several people would have preferred having the course offered over a weekend to avoid missing an entire week in the lab. However, others appreciated being able to reserve the weekends for their families. Because of financial and time constraints, it is unlikely that many organizations could offer a similar intensive course. It is recommended that organizers not try to cover all the topics from the 2002 and 2005 courses but instead select sessions that are especially pertinent to their audience's interests.

COURSE SCHEDULE
2005 BWF-HHMI
Course in Scientific Management

HHMI Headquarters, Chevy Chase, MD

Monday, June 6, to Friday, June 10, 2005

Monday, June 6

3:00–6:00 p.m.	Registration
4:00–5:00 p.m.	Course Organizers' Meeting* *Room D115*
5:00–6:00 p.m.	Partners' Program Meeting* *Room D125*
6:00–6:30 p.m.	Welcome Reception *Great Hall*
6:30–7:30 p.m.	Dinner *Dining Room*
7:30–8:00 p.m.	**Welcome Address** *Auditorium* Peter J. Bruns, HHMI Enriqueta C. Bond, BWF
8:00–9:00 p.m.	**Laboratory Leadership Introduction** *Auditorium* Edward O'Neil, University of California–San Francisco

Rathskeller open until 11:00 p.m.

Tuesday, June 7

7:00–8:00 a.m.	Breakfast *Dining Room*
8:00–10:00 a.m.	**Laboratory Leadership and Management in Science** **Module 1, Leadership Styles and Self-Awareness** *Auditorium, Room D124, Room D125, Rathskeller, Computer Room* Edward O'Neil, University of California–San Francisco Anne Faber, Center for Creative Leadership Ann Lambros, Wake Forest University School of Medicine Thomas E. Sappington, Consultant George E. Sweazey, Executive Development Group, LLC
10:00–10:30 a.m.	Break *Great Hall*
10:30–11:30 a.m.	**Laboratory Leadership and Management in Science** **Module 2, Giving and Receiving Feedback** *Auditorium, Room D124, Room D125, Rathskeller, Computer Room* Edward O'Neil, Anne Faber, Ann Lambros, Thomas E. Sappington, George E. Sweazey

11:30 a.m.–Noon	Break *Great Hall*
Noon–1:00 p.m.	**Laboratory Leadership and Management in Science** **Module 3, Working With Others** *Auditorium, Room D124, Room D125, Rathskeller, Computer Room* Edward O'Neil, Anne Faber, Ann Lambros, Thomas E. Sappington, George E. Sweazey
1:00–2:00 p.m.	Lunch *Dining Room*
2:00–3:30 p.m.	**Laboratory Leadership and Management in Science** **Module 4, Working Through Others** *Auditorium, Room D124, Room D125, Rathskeller, Computer Room* Edward O'Neil, Anne Faber, Ann Lambros, Thomas E. Sappington, George E. Sweazey
3:30–4:00 p.m.	Break *Great Hall*
4:00–4:30 p.m.	**Laboratory Leadership and Management in Science** **Module 5, Acquiring and Using Organizational Power** *Auditorium, Room D124, Room D125, Rathskeller, Computer Room* Edward O'Neil, Anne Faber, Ann Lambros, Thomas E. Sappington, George E. Sweazey
4:30–5:00 p.m.	**Laboratory Leadership and Management in Science** **Module 6, Goal Setting** *Auditorium, Room D124, Room D125, Rathskeller, Computer Room* Edward O'Neil, Anne Faber, Ann Lambros, Thomas E. Sappington, George E. Sweazey
5:00–5:30 p.m.	**Evaluation for Laboratory Leadership and Management in Science** **Session** *Auditorium, Room D124, Room D125, Rathskeller, Computer Room*
6:00–6:30 p.m.	Reception *Great Hall*
6:30–7:30 p.m.	Dinner *Dining Room*
7:30–8:30 p.m.	Partners' Program Meeting* *Room D125*

Rathskeller open until 11:00 p.m.

Wednesday, June 8

7:00–8:00 a.m.	Breakfast *Dining Room*
8:00–9:00 a.m.	**How to Navigate the University Structure** *Auditorium* R. Kevin Grigsby, Penn State College of Medicine
9:00–10:30 a.m.	**Securing Tenure** *Auditorium* Meta Kuehn, Duke University Medical Center Suzanne Pfeffer, Stanford University Matthew Redinbo, University of North Carolina–Chapel Hill

10:30–11:00 a.m.	Break *Great Hall*
11:00 a.m.–1:00 p.m.	**Project Planning: Focusing Your Resources to Get Results** *Auditorium* Milton Datta, Emory University School of Medicine Jonathan W. Simons, Emory University School of Medicine
1:00–2:30 p.m.	Lunch *Dining Room* (participants will be working on a project planning case over lunch)
2:30–4:30 p.m.	**Time Management** *Auditorium* Hopi Hoekstra, University of California–San Diego Sandra L. Schmid, The Scripps Research Institute Brent R. Stockwell, Columbia University
4:30–5:00 p.m.	Break *Great Hall*
5:00–6:00 p.m.	**Mentoring Lecture** *Auditorium* Emily Toth, Louisiana State University
6:00–6:30 p.m.	Reception *Great Hall*
6:30–8:30 p.m.	Dinner and Evening Social *Dining Room and Outdoor Patio*

Rathskeller open until 11:00 p.m.

Thursday, June 9

7:00–8:00 a.m.	Breakfast *Dining Room*
8:00–9:30 a.m.	**Mentoring and Being Mentored Panel** *Auditorium* William E. Goldman, Washington University in St. Louis Jo Handelsman, University of Wisconsin–Madison Neil L. Kelleher, University of Illinois at Urbana–Champaign Collaborations *Rathskeller* Jessica C. Kissinger, University of Georgia Jennifer Lodge, St. Louis University Pradipsinh K. Rathod, University of Washington–Seattle
9:30–10:00 a.m.	Break *Great Hall*
10:00–11:30 a.m.	**Mentoring and Being Mentored Panel** *Auditorium* William E. Goldman, Washington University in St. Louis Jo Handelsman, University of Wisconsin–Madison Neil Kelleher, University of Illinois at Urbana–Champaign **Collaborations** *Rathskeller* Jessica Kissinger, University of Georgia Jennifer Lodge, St. Louis University Pradipsinh Rathod, University of Washington–Seattle

11:30 a.m.–Noon	Break *Great Hall*
Noon–1:00 p.m.	**Sex and Science** *Auditorium* Jo Handelsman, University of Wisconsin–Madison Sarah Miller Lauffer, The Wisconsin Program for Scientific Teaching Christine Pfund, The Wisconsin Program for Scientific Teaching
1:00–2:00 p.m.	Lunch *Dining Room* (participants will continue the "Sex and Science" discussion over lunch)
2:00–4:00 p.m.	**Teaching and Course Design** *Auditorium* Curtis R. Altmann, Florida State University College of Medicine Jo Handelsman, University of Wisconsin–Madison Manju M. Hingorani, Wesleyan University
4:00–4:30 p.m.	Break *Great Hall*
4:30–6:00 p.m.	**Strategies for Success for Basic Scientists** *Auditorium* David Cortez, Vanderbilt University Jo Handelsman, University of Wisconsin–Madison Sandra Schmid, The Scripps Research Institute **Strategies for Success for Physician-Scientists** *Rathskeller* Martin J. Blaser, New York University School of Medicine Suzanne Pfeffer, Stanford University Christine E. Seidman, Harvard Medical School Matthew L. Warman, Case Western Reserve University
6:00–6:30 p.m.	Reception *Great Hall*
6:30–7:30 p.m.	Dinner *Dining Room*
7:30–8:30 p.m.	Partners' Program Meeting* *Rathskeller*
7:30–8:30 p.m.	**Mock Study Section** *Auditorium*

Rathskeller open until 11:00 p.m.

Friday, June 10

7:00–8:00 a.m.	Breakfast *Dining Room*
8:00–8:15 a.m.	**Scientific Management: A Personal Perspective** *Auditorium* Thomas Cech, HHMI

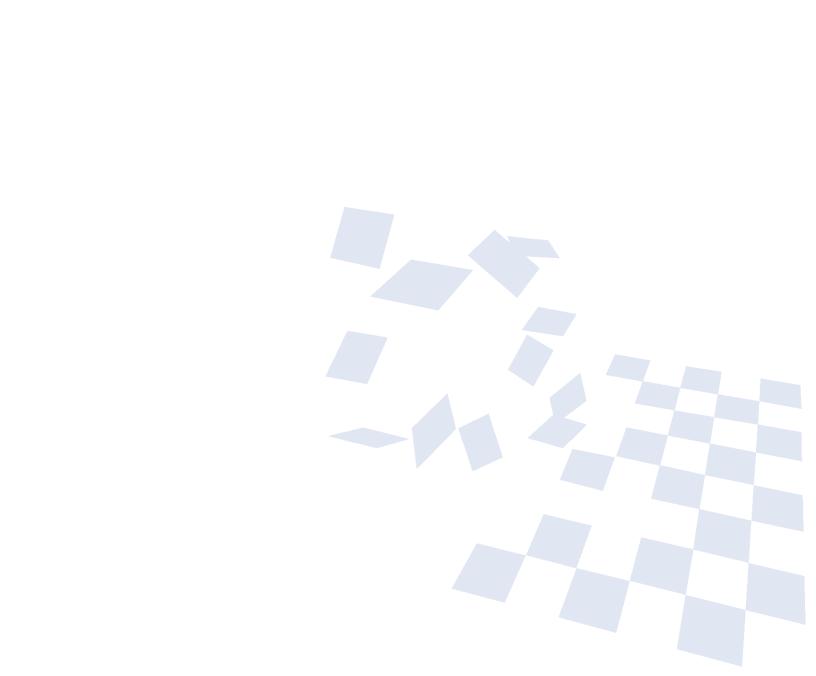|	
8:15–10:15 a.m.	**Getting Funded and Budgets**
	Auditorium
	Anna M. McCormick, National Institute on Aging, National Institutes of Health
	Robert J. Milner, Penn State College of Medicine
	Judith E. Plesset, National Science Foundation
10:15–10:45 a.m.	Break
	Great Hall
10:45 a.m.–12:45 p.m.	**Problems and Solutions in Scientific Management**
	Auditorium, Rooms D124, D125, D115, D116, Sitting area outside Room D124, Sitting area outside Room D125, Rathskeller, North Lounge, South Lounge
12:45–1:00 p.m.	Adjournment
	Auditorium
	Peter J. Bruns, HHMI
1:00 p.m.	Boxed Lunches and Departures
1:15–2:30 p.m.	Partners' Program Meeting*
	Room D125

*The Course Organizers and Partners' Program sessions are not open to course participants.

COURSE SUMMARY EVALUATION FORM

2005 BWF-HHMI Course in Scientific Management

COURSE SUMMARY EVALUATION   **Badge Number:**_____

Personal Demographics (please check one box in each column)

Gender	Degree	Position	Funding Source
Male:	MD:	Postdoc:	BWF:
Female:	MD/PhD:	Jr. Faculty:	HHMI:
	PhD:	Other (specify):	Both:
	Other (specify):		(Partners leave blank)

Check the appropriate box:

Rate the *course* in terms of	1 Excellent	2 Very Good	3 Good	4 Fair	5 Poor
Overall quality of the content and format					
Relevance to your role as a scientific manager					
Opportunities for networking					

Check the appropriate box:

Rate the *speakers* in terms of	1 Excellent	2 Very Good	3 Good	4 Fair	5 Poor
Overall quality					
Demographics (career levels, gender, etc.)					

Would you recommend this course to an associate?
☐Yes   ☐Maybe   ☐No

Overall course length:
☐Too long   ☐About right   ☐Too short

Rate the course activities in terms of their value to you (rate only those you attended):

	1 Very Valuable	2 Somewhat Valuable	3 Average Value	4 Below Average Value	5 Not Valuable
Sessions					
Laboratory Leadership and Management in Science					
Securing Tenure					
Project Planning: Focusing Your Resources to Get Results					
Time Management					
Teaching and Course Design					
Getting Funded and Budgets					
Problems and Solutions in Scientific Management					
Concurrent Sessions					
Mentoring and Being Mentored Panel					
Collaborations					
Strategies for Success for Basic Scientists					
Strategies for Success for Physician-Scientists					
Keynote Talks					
How to Navigate the University Structure					
Mentoring Lecture					
Scientific Management: A Personal Perspective					
Workshops					
Sex & Science					
Mock Study Section					

Please indicate whether the number of participants in the course was:
☐Too many   ☐About right   ☐Too few

Please indicate whether the level of teaching in the course was appropriate to your degree of experience in laboratory management:
☐Too advanced   ☐About right   ☐Too basic

Please estimate how the information learned in the course will change how you manage and organize your lab (please leave *blank* if you do not currently manage a lab):
☐Significantly change   ☐Moderately change   ☐No change

Comments: _____
_____
_____

What do you think was the *single* most important component of the course and why?
_____
_____

What topics would you add *or* exclude in future course offerings and why?
Add:_____
_____
Exclude:_____
_____

How can we improve or enhance this kind of course in the future?
_____
_____
_____

Overall comments about the course:
_____
_____
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