



---

# Meeting of the BIO Advisory Committee Summary Minutes November 2-3, 1995

---

## THURSDAY, NOVEMBER 2 - MORNING SESSION

---

### **Welcome and Introduction of New Members**

Dr. Pete Magee, Chair of the Advisory Committee for Biological Sciences (BIOAC) convened the meeting at 9:00 am with a welcome to members and guests. Dr. Mary Clutter, Assistant Director for Biological Sciences (BIO), addressed the BIOAC and noted the period of transition NSF is in, given the probability of reduced budgets over the next several years. She asked the BIOAC to make recommendations to BIO in light of this situation. Dr. Clutter introduced Dr. Anne Petersen, Deputy Director of NSF.

### **Discussion with the Deputy Director of NSF, Dr. Anne Petersen**

Dr. Anne Petersen briefly addressed NSF's current budget situation. She stated that relative to other agencies, NSF likely will not suffer as many cuts. However, overall reduction in research funding throughout the Federal Government is likely to place a bigger burden on NSF. She then turned her attention to the need for NSF to champion the importance of basic research in a time of reduced budgets. She believes that presenting a unified front to Congress and the public is essential. Divisiveness among scientific disciplines can send Congress the message that it is appropriate for them to pick and choose among various fields when providing funding. This can lead to an overall reduced budget for basic research. In conclusion, she appealed to the BIOAC to encourage support for science education and cohesiveness in the scientific community.

In response to Dr. Petersen's comments, the BIOAC discussed how NSF and the scientific community can approach the public on recognizing the importance of scientific research.

Dr. Nina Fedoroff commented that in times of reduced budgets, priorities will have to be made, and these may favor some disciplines over others. Dr. Petersen responded that NSF's current budget strategy is to maintain a balance across all disciplines while allowing for new opportunities and investigators.

Dr. Petersen and the BIOAC discussed various issues brought up at the Workshop on Improving the NSF Proposal Review Process (September 15, 1995), particularly:

- NSF's current proposal review process;
- the appropriateness of funding investigators primarily on past accomplishments;
- encouraging investigators to use email to give NSF feedback on the proposal review process and address their specific proposal issues

Dr. Petersen concluded her session by briefly discussing the increasing importance of the Government Performance and Results Act (GPRA) and NSF's response to it. This led to a discussion by the BIOAC on the general issue of accountability and educating the public on what NSF does.

### **Follow-up to Workshop on Improving NSF's Proposal Review Process and Approval of Minutes- April 1995 Meeting**

The minutes for the April 3-4, 1995 meeting were approved, with a small correction to Dr. Barbara Webster's comments.

Dr. Pete Magee reviewed some of the suggestions considered by the Workshop on Improving NSF's Proposal Review Process:

- The need for consensus on basic review criteria across NSF.
- A challenge grant fund should be developed to encourage innovative change at universities.

Dr. Magee wanted the committee to discuss this point in particular.

- Reviews that address a list of distinct criteria (disaggregated) may be more useful than the current prose method.

### **Congressional Update**

Joel Widder gave an overview of NSF's budget process over the last year. In particular, he mentioned the impact of congressional change and turbulence on NSF. Mr. Widder then reviewed the authorization and appropriations bills currently in Congress, particularly the Civilian Omnibus Science and Technology bill currently in the Senate. Mr. Widder felt that it is unlikely an authorization bill will pass this session.

The BIOAC discussed the ramifications of budget balancing measures on NSF and basic research throughout the Government, as well as possible future budget cuts.

### **Report on BIO AC Actions**

Dr. Clutter reviewed the changes in the BIOAC. Dr. Nina Fedoroff is the new Chair-Designate., Dr. Pete Magee is Chair, and Dr. Judith Ramaley is Past Chair.

Dr. Clutter discussed how the Directorate sets priorities and the role of the BIOAC. In particular, she commented on the following points:

- BIO sets priorities through an analysis and assessment process

Dr. Clutter reviewed the charge, recommendations, and outcomes of the task force that

analyzed the BBS (Biological, Behavioral, and Social Sciences) Directorate in 1990. This task force led to the reorganization of the BBS Directorate into BIO and SBE.

- Dr. Clutter discussed the BIOAC's previous recommendations and resultant outcomes, including its response to Drs. Lane and Petersen's letter to Advisory Committee Chairs. She asked the BIOAC to carefully consider NSF's role in university institutional change.
- Dr. Clutter briefly discussed the current role of the Committee of Visitors (COV) and asked the BIOAC to discuss expanding the charge of the COVs during the Friday session.

Dr. Clutter finished her presentation by asking the BIOAC if it is time for another task force or another similar endeavor to analyze the role of BIO in the new budgetary environment.

### **Planning for BIO in the New Era: Senior Staff Retreat**

Dr. James Edwards, Executive Officer, discussed the current planning process for BIO, using the most recent Senior Staff Retreat as an example.

First, Dr. Edwards presented BIO's criteria for developing priorities. In particular, he noted the importance of synergy and partnerships in an era of declining budgets, and that this is likely to lead to an increasing number of interagency efforts.

Dr. Edwards also outlined the process BIO uses to identify and select priority areas. The BIOAC discussed how this process can help the Directorate to recognize new areas of understanding, and therefore remain forward thinking in all aspects of the biological sciences.

Dr. Edwards then reviewed the outcomes of the 1995 Senior Management Retreat, held in Airlie, Virginia. The retreat was structured around NSF's four core strategies:

- Integrating education and research
- Developing intellectual capital
- Strengthening physical infrastructure
- Promoting partnerships

Senior staff discussed BIO's priorities within the context of these core strategies.

In particular, Dr. Edwards asked the BIOAC to think about the effects of the partnerships BIO is putting together.

Dr. Pete Magee mentioned the benefits of having the BIOAC Chair participate in the retreat. The BIOAC was in agreement that the Chair should attend future Senior Staff Retreats.

### **New Directions in Undergraduate Education**

Dr. Mel George, Chair of the Subcommittee on Undergraduate Education Review of the EHR Advisory Committee, gave an overview of his report on new directions in undergraduate education.

Dr. George first discussed the history of systemic thinking about undergraduate education. He noted the increased need for science, technical and math skills in the workforce over the past ten years.

Dr. George then outlined the process of his study, which will be done in cooperation with the National Research Council, and then gave an overview of the proposed content of the report. He noted the following outcomes as especially important:

- NSF needs to take a leadership role in undergraduate science and technology education, which should involve a clear agenda and mechanism for NSF's activities.
- Education programs should be centered in the process of scientific inquiry and include direct experiences with scientific methods.
- Undergraduate education should be centered on learning, rather than teaching, and be more connected to student experiences.

The BIOAC discussed the logistics of engendering support among the publishing community for module publications. Accessibility to module publications and textbooks supported by NSF was considered a particularly important issue.

The BIOAC considered the role of the traditional laboratory setting in science education and the gradual elimination of labs due to institutions' increasing budget constraints.

### **Working Lunch--Undergraduate Education**

The BIOAC and Dr. George continued their discussion of undergraduate education over lunch.

The BIOAC addressed NSF's role in promoting change in undergraduate science and technology education. Should NSF be proactive in initiating change or praise efforts initiated by institutions?

The BIOAC further explored the importance of making science education relevant to students' experiences in order to promote greater interest and understanding. Student accessibility to faculty was also mentioned as an important factor. This led to a discussion on promoting intellectual challenge in teaching.

Fact versus problem based learning was considered carefully by the BIOAC, particularly the following issues:

- level of motivation and ability as a factor in determining teaching style
- the need for standardized test preparation
- potential long term benefits of problem-based vs. fact-based learning

## **THURSDAY, NOVEMBER 2 - AFTERNOON SESSION**

---

### **Changes at Other Agencies**

#### ***United States Department of Agriculture (USDA)***

Dr. Floyd Horn, Acting Under Secretary for Research, Education and Economics, discussed the potential effects of the budget reconciliation debate on the USDA. They expect to receive some cuts, but will probably do well overall. Current projects will be finished, but it will be difficult to start new ones. The USDA is likely to receive \$1.2 billion for its mission area, with a \$3 million cut to the Agricultural Research Service.

The BIOAC asked about the National Research Initiative's competitive grants program, which will likely receive \$97 million in funding and will concentrate on giving five-year grants.

The BIOAC was also concerned about the implications of Congress targeting specific programs as priorities. They felt that this could have an adverse effect on the integrity of basic research.

### ***Environmental Protection Agency (EPA)***

Dr. Robert Huggett, Assistant Administrator for Research and Development, discussed the implications of the current budget situation for EPA. So far, the EPA has not received a budget from Congress. The Senate is concerned that laboratories outside of the Research and Development Office's purview have not yet reorganized. This concern is likely to have a negative impact on research and development labs, since all EPA labs will be funded out of the same budget. Research and development labs have reorganized around the risk assessment paradigm. Each lab now has a management deputy and a science deputy.

Dr. Huggett also discussed cuts in staff at headquarters and the possibility of lab closures in the future.

For the first time in its history, the EPA has a strategic planning process. They are also developing an extramural competitive grants program. Dr. Huggett discussed the EPA-NSF Water and Watersheds competition as an example of this. EPA has also instituted a fellowship program, which hopes to support 200 students in 1996 and 300 in 1997. For their own scientists, they are developing an internal grants program to help them be more competitive with academic scientists. EPA is also exploring ways for their scientists to compete for the same grants as academics.

### **Evolving Roles and Responsibilities of Program Officers**

Dr. Joann Roskoski, Deputy Division Director for Environmental Biology (DEB), explained the complex set of tasks that program officers are responsible for at the NSF, and in BIO in particular. She outlined five major responsibilities that program officers have:

- Disciplinary Programs
- Independent Research Activities
- Cross-Directorate Programs
- Partnership Activities
- Outreach to Public/Schools, etc.

Within partnership activities, Dr. Roskoski described five levels of complexity that may be involved. These include intradivisional, intradirectorate, interdirectorate, interagency, and NSF/private sector. A program officer may have one or more responsibilities within each of these levels of complexity.

Dr. Roskoski pointed out that increasing demands on program officers' time makes them very sensitive to the development of new initiatives, with concern that their disciplinary programs may suffer.

Dr. Roskoski stressed that BIO needs to look at how to best serve the disciplinary programs

while still being involved in these other activities.

The BIOAC discussed the ramifications of BIO's increasing participation in partnerships and agreed to discuss them further in the breakout groups. Dr. Clutter stressed the importance of existing and future partnerships.

### **Organization of Breakout Groups**

Dr. Pete Magee asked the BIOAC to meet in the following breakout groups:

- Partnerships with Universities
- Support for Research
- New Initiatives

He stated that these themes for the groups were chosen because (1) universities' missions are changing in part because legislators are much more interested in these issues than before and want change, (2) NSF's budget is flat but its charge is not changing, therefore the Foundation needs new ways to fulfill its mission.

Dr. Magee requested that the BIOAC provide specific actions that BIO can undertake in this era of change.

The BIOAC met from 2:00 to 4:00 p.m. in their breakout groups.

### **Committee of Visitors Reports**

#### ***Special Projects Cluster, BIR- Presented by Dr. Mary--Dell Chilton***

Dr. Mary-Dell Chilton summarized the contents of the Special Projects Cluster, BIR, COV report. She focused on three issues:

- Panel summaries are too vague
- There should be mechanisms to allow postdoctoral fellows that don't use all of their stipend funds to apply this money towards starting up their research programs. Dr. James Brown, Division Director of BIR, commented that starter matching grants are currently available.
- Due to the infrastructure orientation of the Computational Biology and Database Activities program, the standard review form is not entirely appropriate and should perhaps be revised or supplemented.

#### ***Instrumentation and Instrument Development and Field Stations and Marine Labs, BIR--Presented by Dr. Nina Fedoroff***

Dr. Nina Fedoroff reviewed the major points of the report. In particular, she noted the following comments presented in the COV report:

- Email should be used more heavily in review process, perhaps replacing panel discussions in some cases. However, program officers feel that this is less useful than face to face discussions.
- Site visits are considered important, but the budget doesn't support very many of them. The BIOAC discussed the adequacy of the current site visit program.

Dr. Fedoroff summarized by noting that the program is not fundamentally flawed and its

response to the COV was quite adequate.

***Ecological Studies Cluster, DEB--Presented Via Letter by Dr. Lynn Riddiford***

Dr. Lynn Riddiford has rotated off the BIOAC, and therefore was not present to give her report on the Ecological Studies Cluster COV. However, she submitted a letter. Dr. Riddiford noted the following COV comments as particularly important:

- Young investigators within the first five years of their Ph.D. have lower success rates than other groups. Perhaps including them on panels or targeting this group for workshops will help.
- The division between ecology and ecosystems needs to be bridged by, for example, putting ecosystem scientists on ecology panels and visa versa. Dr. Roskoski commented that the cluster is actively engaged in this through joint panel review of some proposals and possibly having a combined panel in the future.
- Support for special competitions should continue, for they provide more money and opportunities for the community. Conversely, Dr. Roskoski mentioned the lack of lead time and increased work load as problems often associated with special competitions.
- More input is needed from the research community on the direction of the cluster.
- There is a lack of proposals submitted by handicapped and minority scientists. This comment led to a discussion of DEB's minority REU program (University Mentorships in Environmental Biology) by the BIOAC and NSF staff.

***Neuroscience Cluster, IBN***

Dr. Lydia Villa-Komaroff was absent from the BIOAC meeting, and therefore was unable to present the Neuroscience Cluster COV report.

***Genetics Cluster, MCB- Presented by Dr. George Hill***

Dr. George Hill summarized the executive summary to point out the supportive comments made by the COV, and then discussed the following issues:

- The concept of integrating research and education was not fully appreciated by the COV. They felt the best science should be funded by the best scientists at the best institutions. Dr. Hill commented that the community needs to be educated that good science can be integrated with education.
- Like the Ecological Studies Cluster COV, the Genetics Cluster COV noted a lack of proposals from minority and handicapped scientists. Dr. Hill felt that the COV should have considered this issue more fully. The BIOAC and NSF staff continued their discussion on ways to increase participation of minority and handicapped scientists in BIO programs.

***Discussion of New Roles for Committees of Visitors***

The BIOAC discussed the possibility of expanding the role of Committees of Visitors to include more scientific assessment activities. Dr. Frank Harris mentioned that the existing charge is a large enough task. He suggested increasing the size of the COVs or having the BIOAC take on scientific assessment activities.

Dr. Helen Berman suggested that BIOAC members lead each COV in a small discussion about an assessment area important to the COV's particular program. BIOAC members could then

bring these comments back to the entire BIOAC. This would tap the expertise of the COVs without significantly increasing their workload.

Dr. George Langford felt that program officers are doing scientific assessment already, therefore the COVs may not need to.

Dr. Clutter responded that outside groups must help with assessment under GPRA. She felt that the COVs can undertake this because they are very familiar with NSF operations. Dr. Clutter suggested that perhaps everything the COVs currently do is not necessary. Therefore, they may be able to take on assessment activities if other responsibilities are phased out.

The BIOAC agreed that some assessment activities should be taken on by the BIOAC alone or in conjunction with the COVs.

## **FRIDAY, NOVEMBER 3 - MORNING SESSION**

---

### **Report on Workshop on Emerging Technologies**

Dr. Helen Berman reported on the Workshop on Emerging Technologies, which met June 26-27, 1995. The meeting represented a large cross section of biologists, from science and technology center heads to individual investigators.

Some of the emerging technologies discussed included protein biosensors, computational database integration, imaging systems, and nanotechnologies. The importance of education and training in terms of new technologies was discussed extensively.

The BIOAC discussed at length how to effectively cross-train biologists and computer scientists, given increasing linkages between these fields. The issues of differing scientific cultures and institutional barriers to collaboration and cross-training, particularly inflexibility in faculty award mechanisms, were considered especially problematic. The BIOAC went on to explore what NSF's role should be in shaping these issues.

### **Breakout Groups**

The BIOAC met in their breakout groups from 9:00-10:00 a.m.

### **Changes at Other Agencies II**

#### ***Department of Energy (DoE)***

Dr. Aristides Patrinos, Associate Director of Health and Environmental Research, gave an overview of the Office of Health and Environmental Research and their budget outlook.

The office's three divisions, health effects and life science, medical applications and biophysics, and environmental science, demonstrate its broad research portfolio. One of the office's newest research initiatives is waste management in relation to Cold War cleanup.

Dr. Patrinos discussed the office's FY 1996 budget, which will likely be a \$40 million decrease

from the request. Like USDA, the Office of Health and Environmental Research must deal with Congress earmarking certain projects as priorities, particularly medical applications research.

Dr. Patrinos discussed his office's budget priorities, the management and programmatic challenges associated with them, and the future directions they are likely to take.

### ***National Institutes of Health (NIH)***

Dr. Marvin Cassman, Acting Director, National Institute of General Medical Sciences, reviewed NIH's budget outlook for FY 1996. Although they do not yet have a budget, they will likely get a 5.6% increase over last year and a 1% increase over the request. Congress has stressed the need for NIH to keep its flexibility, and therefore is not setting aside certain funds to study specific diseases. Typically, 2/3-3/4 of their budget goes to continuing grants and they expect the number of new grants to remain at the 1995 level.

Dr. Cassman then discussed the future of basic research funding in the Federal Government given the likelihood of flat budgets in the foreseeable future. He stressed the need for investigators to prepare for the effects of these cuts and for agencies to find innovative ways to deal with them.

### **Reports from Breakout Groups and Discussion of an Action Agenda for BIO**

The Breakout Group Chairs reported on the results of their meetings.

#### ***Partnerships with Universities- Reported by Dr. George Langford***

This group discussed ways that BIO can implement or produce better partnerships with universities in facilitating the integration of research and education.

The breakout group felt that BIO and universities need to develop mechanisms to train students for careers in industry rather than just academia. They mentioned Research Training Groups and collaborative research projects as excellent vehicles for industry-oriented training because of their interdisciplinary nature.

The breakout group believed that changing institutional culture to include educational activities, outreach, and community service as criteria for faculty advancement was essential to the integration of research and education. To facilitate this, they recommended a workshop to bring together university administrators, faculty, students and professional society representatives in a discussion on faculty advancement criteria.

The BIOAC discussed the suggested workshop extensively and agreed that its scope should be broadened to address institutional change in response to collaborations and changing needs in student training. Dr. Nina Fedoroff, Dr. Helen Berman, Dr. Pete Magee, and Dr. George Langford will develop suggestions for this workshop and disseminate them to the BIOAC via email.

This group also addressed ways to attract new rotators. They recommended recruiting retired individuals who are no longer actively involved in research, providing incentives such as creativity grants to help rotators make the transition back into research, and educating universities on the positive results of the rotator experience.

### ***Support for Research - Reported by Dr. Mary-Dell Chilton***

This breakout group discussed maintaining the integrity of the peer review process in the face of flat or decreasing budgets. The group recommended (1) increasing the response of ad hoc reviewers by limiting the number of proposals sent to each reviewer, sending out fewer ad hoc requests for each proposal and letting reviewers know this, and asking reviewers if they are willing to review before sending them the proposal; (2) using preproposals in programs where a lot of proposals are expected with a relatively small number of awards; and (3) consider a double blind review system to reduce bias.

The group also discussed consolidating programs. They felt that this may result in panels without enough breadth of expertise to adequately review all proposals.

The BIOAC discussed if there really is bias in the current proposal review system, especially with regard to young investigators.

### ***New Initiatives and the Portfolio Balance- Reported by Dr. Gregory Florant***

This group was charged with recommending ways that BIO can maintain an appropriate portfolio balance with flat or declining budgets. The group recommended that fewer formal announcements be developed and that new initiatives should be channeled into current programmatic areas whenever possible.

They felt that only about 2-3 new initiatives should be developed over the next 4-5 years.

### **Future Business of the BIOAC**

#### **The next BIOAC meeting will be held April 25-26, 1996.**

Dr. Magee stated that BIO needs three BIOAC representatives for upcoming COVs.

The following individuals volunteered:

Dr. Pete Magee for the Developmental Mechanisms Cluster, IBN COV (July 22-24, 1996)

Dr. Frank Harris for the Systematics and Population Biology Cluster, DEB COV (May or June, 1996)

Dr. Helen Berman for the Biochemistry and Molecular Structure and Function, MCB COV (tentatively July 17-18, 1996)

The BIOAC meeting was adjourned at about 12:45 p.m.

APPROVED;

P. T. Magee Nov. 3, 1996

Paul Magee, Chair Date

**[Back to Meeting Agendas and Minutes Page \(../../advisory.jsp\)](#)**

National Science Foundation, 2415 Eisenhower Avenue, Alexandria, Virginia 22314, USA Tel: (703) 292-5111, FIRS: (800) 877-8339 | TDD: (800) 281-8749