



Meeting of the BIO Advisory Committee Summary Minutes April 9-10, 1997

WEDNESDAY, APRIL 9

Welcome and Approval of Minutes

The Spring 1997 Advisory Committee for Biological Sciences (BIOAC) meeting convened at 9:00 a.m. with a greeting from Dr. Clutter. Dr. Nina Fedoroff, Chair of BIOAC, encouraged everyone to introduce themselves to the newest member, Dr. Laura Hoopes. The minutes for the November 1996 meeting were unanimously approved by the BIOAC.

Government Performance and Results Act (GPRA) and Current Budget Environment

Dr. Clutter reviewed the current status of the FY 1998 Budget for NSF noting a total budget request of \$3.367 billion. In BIO, the request reflects a 3.3% increase overall. The FY 1999 budget, which is now in the planning stages, is the first budget to have performance plans attached to it as required by GPRA. Dr. Clutter discussed the importance of the meeting in light of GPRA.

Dr. Clutter requested the committee to think about the following questions during the course of the meeting:

- If NSF continues along a flat line budget, can we continue to deliver on our broad mission and rising expectations?
- Can we keep the scientific enterprise robust and productive? Should we be more entrepreneurial? More proactive with our approach to international activities?
- Do we need a major change with relationship to K-12?
- Should we take bolder steps in partnerships?

Neal Lane, Director, National Science Foundation

Dr. Neal Lane, Director of the National Science Foundation, discussed NSF's response to the Government Performance and Results Act. He thanked the committee members for their advice which enables NSF to remain strong and get the resources that are needed.

In terms of GPRA, Dr. Lane stated the NSF response would include: updating the strategic plan every three years, continuance of evaluation of performance based on peer review, solving the question of how to maintain being on the front edge of science while working on a flat budget. He emphasized that we look to the BIOAC for guidance.

Dr. Lane discussed the new merit review criteria to be implemented in the Fall and, the importance of getting the community to pay attention to them. He also discussed fundamental research problems that need to be resolved. In particular, he discussed Knowledge and Distributed Intelligence (KDI), the Next Generation Internet (NGI) and research education. He noted that NSB board meetings have been reduced to four times a year. The results from the Partnerships in Advanced Computing Infrastructure (PACI) competition were also recently announced.

In response to BIOAC questions, Dr. Lane reminded the committee that NSF cannot lobby, but inviting congressmen to their institutions can make a tremendous impact.

BIOAC discussed whether the budget needed to be reformatted to include GPRA. Other issues included: how will NSF restructure to meet the limitations set by OMB by the year 2003, can performance be leveraged to prove NSF is doing a super job. In addition, the committee asked if there was an advisory committee composed of industrial members; should they be concerned with anything other than dollars; and, what are the best ways for NSF to better educate constituencies.

Priorities for Budget Planning

Dr. Clutter reminded the BIOAC of how priorities for the budget request are developed and gave an update for Fiscal Year 1997. This discussion included updates on the new merit review criteria and a review of the new programs: Professional Opportunities for Women in Research and Education (POWRE), Integrative Graduate Education and Research Training (IGERT), Partnerships in Advanced Computing Infrastructure (PACI), and Knowledge and Distributed Intelligence (KDI).

Report from the BIO Science Retreat

Dr. Bruce Umminger, Division Director of IBN, gave an update on Knowledge and Distributed Intelligence (KDI), beginning with a historical perspective of KDI. Other issues included:

- Proposed strategy by a BIO working group to develop a solid approach to KDI.
- Program announcement encourages technology development to solve research problems.
- Best ways to prepare the scientific community and train postdocs.
- Need to accelerate genomic research on Arabidopsis by making sure necessary analytical tools are developed.
- Development of biological information standards and architecture through accessing databases for knowledge networking: a real challenge.
- Look at new ways of doing things using virtual laboratories, equal access to new technology, issues of shared credit, etc.

BIOAC response:

- Will the development of biological information standards reach across all agencies?
- Information coming out of genomics should be subsumed under this element?
- What is the timeframe?

Dr. Julius Jackson, Division Director of MCB, gave an update on Life and Earth's Environment (LEE) that included:

- Discussion of Life in Extreme Environments (LEExEn) and NSF's commitment to study microbes in extreme geophysical environments.
- How to develop a strategy to study microbial diversity in a variety of environments.
- Vision: how to capture the idea of sustainability.

BIOAC response:

- Where do we go from here? BIOAC needs time to reflect on this one.
- How does it relate to what we have now? Is it new? Is it an umbrella to sweep existing programs or does it lead in completely new directions?
- How is it viewed internally related to programs in place already?
- Will submissions be multidisciplinary, with multiple approaches?
- Need to explore the idea of virtual laboratories, think about their sociology.
- Urban Approaches idea within the LEE framework could be powerful.

Working Lunch Discussion

Informal Discussion with Sue Schafer, NIGMS, and Ari Patrinos, DOE

Sue Schafer, NIGMS, discussed how NIH makes communicating its mission easier. One way is to provide a package for NIH's advisory counsel spokespersons to present to the public. NIH Program Officers write their researchers reminding them to give NIH credit for supporting their research, especially in press releases.

Other issues being studied by NIH include how to make integrative biology databases more accessible, are new investigators receiving enough support and what are the consequences of bringing new people into the system? In addition, NIGMS's new program for bridge funding for investigators who just missed the cut was discussed.

BIOAC response:

- Is the bridge funding limited to second-time applications?
- Any difference in the way NIGMS will handle a grant in light of the new review criteria? (Answer: Not fully decided, the scores will be rounded to the nearest tenth and a new announcement will be put out on high risk research.)

Aristides A. Patrinos (DOE)

Discussion of DOE current status included:

- Delight with budget negotiations at present, flat budget request is better than expected.
- OHER (Office of Health and Environmental Research) is focused on the DOE Genome Institute; it will have academic collaborations by soliciting proposals from the community.
- Microbial Genome Project seeking \$7 million increase in funding.
- Beefing up structures like the neutron source facility in Los Alamos and Oak Ridge Labs.

- New initiative: Bioremediation Research.
- DOE approach to environment found in Global Change Research Program.

Report on the Human Resources Development Working Group by Dr. Julius Jackson

Dr. Jackson discussed three recommendations made by the Human Resource Development Working Group (HRDWG). The working group was charged with recommending a strategy and implementation plan that will help the Foundation better achieve -- through best practices -- the goals set forth in the Science and Engineering Equal Opportunities Act of 1980. The objective is to "achieve full inclusion and participation by historically excluded U.S. citizens and to sustain world leadership in scientific research." Dr. Jackson discussed the recommendations made on Graduate Student Support Strategies, Management Strategies, and "Best Practices" Dissemination Strategies.

Breakout Groups Discussion

Breakout Groups looked at reports from BIO Working Groups on Graduate Students and Postdoctoral Fellowships.

Reports from Breakout Groups

4:10 p.m. group reconvenes

Postdoctoral Fellowships

Discussion Leader: Barbara Webster

The following recommendations were made by the group:

- Individual postdoctoral fellowships should continue, they bring visibility to NSF and are important to the community.
- Targeting should continue and should be followed up.
- Conditions of the fellowship should include other aspects of learning such as:
 - teaching
 - linkages with industry
 - international activities
- GOALI was cited as an example that encourages the postdoc to get a supplement to work in industry.
- Biosciences Related to Environment Program should be terminated. A generic announcement should replace both Molecular Evolution and Biosciences Related to the Environment; need to think more about these replacement programs.
- Minority Postdoctoral Program has been successful, half of the recipients have found jobs in academia. A web page lists them. Group recommends the program continue but as a separate entity.

Graduate Students

Discussion Leader: William Greenough

The following suggestions were made:

- Graduate students should be funded by an add-on to a regular grant that includes: bio sketch, how student got there, current status, description of plan, and research training record.
- Two modes of application: as part of the research proposal or as a supplement.

- Group reached consensus that following this procedure will mean that the student will have more access to training, increased likelihood of getting a job; and, this procedure will therefore contribute to the national interest overall.
- Disagreement within the group as to whether or not U.S.citizenship or permanent residence status should be a requirement.
- More emphasis should be placed on research training grants. With the faculty working together you get a much better training program.

BIOAC comments:

- Part of the objective is to change how graduate students are trained. Is it better to do this in a group mode than by individuals?
- What problem are we trying to fix? Why fix what is not broken? Plenty of journal clubs, cross-talk, etc., already exist in most graduate programs.
- Making teaching a part of your training is difficult in terms of getting the time to do so.
- Question of accountability, what are the students doing and are they benefiting?
- What constitutes good training, is the current training too narrow as reported by NRC?
- Limiting training to U.S. citizens will have an impact on the quality of science and is a major change.

THURSDAY, APRIL 10

Discussion on BIOAC Workshops

Report on "Integrating Life Sciences" Workshop by Dr. Gregory Florant

Purpose of the workshop: Two main areas of focus for the workshop were interdisciplinary research and preparation of undergraduate and graduate education in terms of teaching and research for the 21st century.

Interdisciplinary aspect: Much of the cutting edge research is cross-disciplinary. Is the structure at land grant institutions still viable; now, the department system is in use, is this still a good idea? Is reorganization the answer for meeting the interdisciplinary needs?

Preparing students for the 21st century: broad training is necessary in biological or life sciences; teaching of critical thinking and concepts in problem solving is needed. Giving undergraduates research experience is recognized as important but is difficult to manage.

Report on Current Environment at EPA by Robert Huggett

This report included the status of the EPA budget reflecting an increase of \$50 million that will be in several major areas:

- Particulate matter and its effect on humans. There is controversy that has arisen over an order to release all data used in these studies irregardless of confidentiality.
- IMPACT program where, through five pilot studies, citizens in larger cities have real time

access to information on their environment.

- An effort to study risks to children that includes mercury level effects and endocrine disruptors.
- AMI, Advanced Monitoring Initiative, used to monitor instrumentation capabilities.
- Focus on UVB radiation and its effects on plants and animals.
- \$100 million estimated to go toward external grants program.
- \$3.5 million toward sediments.
- Three hundred new positions to be obtained in the fellowship division

Dr. Ruddle made a motion to have NSF staff evaluate the idea of having a new panel for molecular evolution. The molecular evolution postdoctoral competition has stimulated a group of individuals in this new area. Molecular evolution is an important field. We should review molecular evolution and other subject areas of like kind which might also need a dedicated panel. Recommend the staff look into the matter and review findings at next meeting.

Motion is agreed to and seconded: VOTE: 13 - In Favor 0 - Opposed 1 - Abstained

Report on Advisory Committee Chairs Meeting by Paul Magee

GPRA becomes effective in FY 1999. How do you really measure discovery within a given time line (five years and on). NSF wants to discuss qualitative measures, not quantitative. COVs will be a major part of the NSF approach.

Issues on the existing GPRA document include:

- Level of abstraction and complexity overwhelming.
- Objectives: too many to convince external observer of progress.

BIOAC comments:

On abstraction and complexity:

- Different people were involved in putting document together, shows two different views: selling a budget, or focusing on assessment.
- Two things are mixed up here: NSF as a managed entity and NSF in terms of how well it fulfills its mission.

On where NSF will be in the year 2002:

- Need to formulate a statement in 1997 that says this is where we decided to be five years from now. Produced "x" number of discoveries, developed a workforce, etc.
- State how NSF is on the leading edge by work in facilities/instrumentation, promotion of math/science literacy, workshop outcomes; streamlining of NSF review process over the Internet, for instance.
- Issue of how NSF will deal creatively with a flat budget.

The BIOAC Executive committee agreed to craft a letter summarizing the discussion and send it to Dr. Neal Lane.

Reconvenes at 12:30 p.m.

Recommendations from Breakout Groups

Postdoctoral Fellowship Report

Individual fellowships to support postdocs are important to the community and should continue. Targeting specific areas of biology should also continue. We must make conscious decisions on areas of importance; and, there should be follow-up on these areas.

Recommendation

Sunset the Biosciences Related to the Environment Program and narrow the focus of the Molecular Evolution Program to evolution of development. In the first year of the latter program, look at the numbers that are coming in and make an assessment. Continue the program for no more than three years.

Industrial Linkages

On visits to Industry by applicants for NSF Postdoctoral Research Fellowships

Dr. Paul Magee reports

Two types of visits exist: the first is to take advantage of facilities and opportunities for the particular purpose of advancing the research proposed in the individual investigator's grant; the second is for the purpose of pursuing a project of joint interest to the industry and to the individual investigator's grant. In the former case, cost-sharing should be arranged between the company and the principal investigator in a mutually satisfactory fashion. In the second case, industry should assume at least 50% of the total cost, including salary and research support.

Graduate Students Report

Dr. Greenough reports

- 1) The Graduate Students breakout group supported the idea of developing new research experiences for graduates (REG) supplements. To the extent that an award is "training" driven, NSF policy mandates restriction of the award to US citizens or Permanent residents. The guidelines of the proposed REG supplements specify that they are primarily training driven, in terms of the selection process. That suggests that these awards should be restricted to citizens and permanent residents. However, there was not consensus among the BIOAC that all BIO-supported graduate students should be citizens or permanent residents.
- 2) Because the new NSF merit review criteria mandate "promoting teaching, training and learning," the emphasis placed upon the graduate education process in the separate evaluation of REG components of individual investigators-initiated proposals is appropriate and necessary.
- 3) Whenever possible, the REG application should be submitted as a component of the research proposal and should be funded as a single award.
- 4) Multidisciplinary, multiple-investigator training grants such as Research Training Groups (RTG's) and Integrative Graduate Education and Research Training (IGERT) are of great value because of their explicit orientation towards integration of education, training and learning. We

recommend that two size categories of RTG/IGERT awards be evaluated separately; those with 3 or fewer principal investigators and those with 4 or more. We further recommend that BIO resources directed to such training groups be doubled.

Report by Dr. John Fray on the Multidisciplinary Review Experiment (MULE)

The MULE group was charged with designing an experiment to compare disciplinary and multidisciplinary review processes utilizing a subset of selected multidisciplinary proposals. It decided to do a "shadow" review of a set of multidisciplinary proposals, using a specially constituted panel composed of multidisciplinary individuals.

Design of Experiment:

- Select group of proposals that are being reviewed by at least two program elements;
- Timing of the "shadow" panel: concurrent with regular program panels.
- Composition of MULE panel: individuals who are multidisciplinary in their interest based on their publication record and training.

Will report results at next meeting.

Three BIOAC members volunteered to serve on Committees of Visitors this summer:

- Dr. Jacobs will serve on the Division of Integrative Biology and Neuroscience COV.
- Dr. Villa-Komaroff will serve on the COV for the Cell Biology Cluster.
- Dr. Harris will serve on the Long Term Projects COV.

Future Business

Discussion of potential meeting dates for next meeting: October 20 - 21, or October 23 -24 or October 27- 28. At the next meeting, topics to discuss include GPRA and the recommendations from the Equal Opportunity report.

Meeting concluded at 1:55 p.m.

Hardcopy minutes approved by: Lydia Villa-Komaroff, Chair

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