

Response to Recommendations from the Committee of Visitors
Division of Integrative Organismal Systems
June 30 – July 1, 2011

INTRODUCTION

The Directorate for Biological Sciences (BIO) would like to thank the Committee of Visitors (CoV) for their efforts in evaluating the management and outcomes of the Division of Integrative Organismal Systems (IOS) at NSF. BIO is aware of the extraordinary amount of work that the CoV members contributed before and during the meeting and is especially appreciative of their commitment to this important review. The thoughtful report that emerged from the CoV deliberations is appreciated highly by BIO and IOS.

BIO acknowledges the thoughtful responses to the questions posed to the CoV in Part C of this report. The recommendations regarding the ability to evaluate project outcomes and the CoV review process will be considered carefully and followed up to the extent possible. Responses to the specific questions posed in the Charge were also very thoughtful and will be helpful as the Division continues to develop new scientific directions. In August 2011, IOS (along with DEB) announced its intention to change from two deadlines a year for unsolicited proposals to a Core Program Solicitation with a single annual deadline for preliminary proposals in January of each year starting in January 2012. Clearly, some of the issues identified by the CoV will be important considerations for IOS as it discusses the implementation of this new plan at its September 2011 retreat.

RECOMMENDATIONS AND RESPONSES

Section I

Recommendation: *In general, we found that panel activities were well documented, but the subsequent internal review process, which leads to the final funding decision, was less transparent.*

Response: Funding recommendations are developed by the Program Director(s) managing the proposals. After the panel meeting, the Program Directors meet to discuss the panel's recommendations and their potential choices for funding. These recommendations are considered in the context of balancing the portfolio with respect to such aspects as scientific area, potential for transformative advances, gender, ethnicity, career stage, geography, and institutional type. The slate of recommendations is discussed with the Division Director (DD) and Deputy Division Director (DDD) in a post-panel briefing and the DD or DDD concur all award and declination recommendations

prior to their communication to the PI. The process is summarized on the NSF web site¹. This information is often discussed when a PI contacts the managing Program Director after his or her proposal action has been recommended for an award or decline.

Recommendation: *The CoV recognizes and supports EAGERs as a mechanism to support transformative research and RAPIDs as a mechanism to support time-sensitive research, but we recommend inclusion of more detailed documentation on the review process for these submissions included in the jacket.*

Response: This information is included in the Review Analysis. In IOS, the internal review process normally includes solicitation of written comments from Program Directors with appropriate technical expertise. The managing Program Director uses this input as part of his or her decision as to whether or not to recommend an award. The written comments are uploaded into the jacket as part of the documentation. If external ad hoc reviewers are used, the reviews are released and provided to the PI at the conclusion of the action.²

Recommendation: *The review analyses by the program officers do an excellent job of remediating gaps in the panel summary with respect to broader impacts. We found instances, however, of review analysis with no comments on the broader impacts of the proposal. The CoV recommends that NSF continue its campaign to educate reviewers on the criteria for broader impacts and expectations for their scope and considers structuring these criteria to prevent a disparate array of answers in the review process.*

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Response: In FY 2010, IOS implemented a standard welcome and introduction from the Division Director and/or Deputy Division Director. The introduction includes remarks about the importance of complete panel summaries that accurately reflect the panel discussion, including the broader impacts of the proposed work. Panel discussions are monitored by the managing Program Director to ensure that both the broader impacts and intellectual merit are discussed and the Panel Summaries are reviewed to ensure that these aspects are documented appropriately. The Division Director/Deputy

¹ <http://www.nsf.gov/bfa/dias/policy/meritreview/phase2.jsp#analyze>

² http://www.nsf.gov/pubs/policydocs/pappguide/nsf11001/gpg_2.jsp#IID1

Division Director checks the Panel Summary and Review Analysis to ensure that the broader impacts are considered. Over the past year, the National Science Board Task Force on Merit Review has examined the two merit review criteria and their effectiveness in achieving the goals for NSF support for science and engineering research and education (see http://www.nsf.gov/nsb/committees/tskforce_mr_charge.jsp). A draft report was discussed at the May 2011 National Science Board meeting and the final report is anticipated at the end of 2011 or early 2012.

Recommendation: *The CoV suggests that the utility of panel summaries would be improved by universal inclusion of an explicit statement of the rationale for the panel decision. When panel summaries do not provide a clear rationale for decision the CoV recommends the wider use of the PO comment to provide clarity to the PI.*

Response: As discussed above, the panels are reminded of the importance of the Panel Summaries in conveying the reason(s) for the ranking of each proposal and the Panel Summaries are reviewed during the panel meeting for completeness and accuracy. PO Comments are used in the rare occasions where the Panel Summaries are unclear or incomplete and IOS plans to continue this practice.

Recommendation: *In a few instances where high priority proposals were denied, the rationale was unclear. The CoV recommends that the review analysis universally include explicit reasons for decline of high priority proposals.*

Response: The Review Analysis should contain explicit reasons for the final recommendation, whether for an award or a declination. The Division Director/Deputy Division Director monitors these documents carefully to ensure that explicit reasons are included and returns actions to the Program Directors where this is not the case. To minimize omissions in the future, new Program Director mentoring covers expanded discussion of the critical components of a Review Analysis, including an explicit statement of the reason(s) for the recommendation made.

Recommendation: *The CoV recommends consistent use of clear program officer comments in the panel summary, where high priority proposals have been declined, or in instances where there was no panel review (COI).*

Response: The use of Program Officer Comments to rectify omissions in the Panel Summary and to communicate the reasons for declination of highly ranked proposals is currently a best practice in IOS and this will continue. The Program Officer Comments

section of FastLane is separate from the Panel Summary module. As a best practice, Panel Summaries are only modified to correct formatting and typographical errors, or to redact inappropriate comments.

Section II

***Recommendation:** For proposals reviewed internally, however the documentation of reviews was not as transparent in the jackets reviewed. The CoV recommends that IOS consider the use of ad hoc reviewers to support programmatic recommendations where appropriate.*

Response: In IOS, the internal review process may use different mechanisms, depending on the type of request and amount of funding requested. For workshops and conferences requesting less than \$50,000 or supplemental funding requests of less than \$100,000, the review is undertaken by the managing Program Director. For requests above these amounts, the proposals are sent out for external ad hoc review and the reviews are provided to the applicant after the action is completed. However, it is at the Program Director's discretion to use external ad hoc reviews for any of these actions if deemed necessary for scientific and/or managerial reasons. As discussed above, RAPIDs and EAGERs usually undergo internal review by multiple Program Directors but can also be sent out for external ad hoc review if needed and in these cases the reviews are released to the PI at the conclusion of the action.³

Section III

***Recommendation:** The CoV strongly encourages IOS to strive for continuity from CoV Report to Self Study Report.*

Response: IOS appreciates the importance of this recommendation and will ensure that the next CoV Self Study includes a section summarizing the recommendations from this CoV, how they have been addressed, as well as the outcomes.

Section IV

***Recommendation:** About 25% of awards are multidisciplinary as indicated by the PI. The CoV suggests it would be valuable to validate all multidisciplinary designations at the time of award.*

³ http://www.nsf.gov/pubs/policydocs/pappguide/nsf11001/gpg_2.jsp#IID1

Response: IOS agrees that it would be valuable to validate all multidisciplinary designations at the time of the award and this step will be incorporated into the standard operating procedures for making awards after the switch to the IOS Core Program Solicitation in January 2012⁴.

***Recommendation:** Based on Table 7 in the Self Study Report, the balance of the awards was considered appropriate except that 4-year institutions only get approximately 2.5% of the awards. The CoV feels that this proportion is too low...One possible mechanism considered by the CoV was solicitation of small grants that would allow PIs at PUI institutions a chance to get started, as preparation of preliminary data for an RUI grant can be a high hurdle for someone who is entirely unfunded.*

Response: IOS shares the concerns of the CoV that the number of awards made to 4-year institutions is disproportionately low and believes that a multipronged approach will likely be necessary to increase the number of proposals as well as the success rate. This issue will be included in the planning for managing the new IOS Core Program Solicitation, which takes effect in January 2012. In addition to the interesting mechanism proposed by the CoV, IOS will also consider additional outreach strategies.

***Recommendation:**... information provided during the CoV meeting (giving the number of submissions from and awards to beginning investigators, new investigators and CAREER proposals separately) indicates that while the percentage of awards to each of these groups is not declining, there is no evidence of increased funding to beginning or early career investigators during the time period under consideration. This is an issue of some concern to the CoV, particularly in light of the fact that program officers actively address the issue during the selection process and the BIO Directorate priorities for FY 2012 highlight the CAREER program. Perhaps IOS should look at alternatives to address this concern.*

Response: IOS agrees that additional efforts will be needed to increase the success rates for beginning or early career investigators. Strategies for dealing with this issue will be included in the planning for managing the new IOS Core Program Solicitation, which takes effect in January 2012.

***Recommendation:** Data provided indicate that the success rate of proposals with minority involvement and from minority serving institutions is largely similar to the success rates of all proposals, which is highly appropriate. The exception is that*

⁴ http://www.nsf.gov/publications/pub_summ.jsp?WT.z_pims_id=503623&ods_key=nsf11572

success rates of minority serving institutions and PUI schools failed to increase in 2009 when other funding rates went up due to ARRA money.

Response: NSF made the decision to prioritize the use of ARRA funds to support proposals that had already been received and reviewed in FY 2009; thus the award recommendations to PUIs and minority serving institutions reflected highly ranked proposals already received and reviewed. The larger issue is how to increase the success rate of proposals from these institutions. This is an issue that the IOS Broadening Participation workshop will consider in fall 2011.

Recommendation: *The CoV suggests that standard operating procedures for proposal and award tracking relative to the questions asked in Section IV be developed.*

Response: IOS appreciates this recommendation and will develop standard operating procedures to gather the data that tracks directly to the Self Study questions.

Recommendation: *IOS funds a wide range of outstanding research proposals that lead to many ground breaking scientific discoveries. However, the IOS budget is clearly a limiting factor.... This can only be corrected by increased funding for IOS-supported basic research.*

Response: IOS appreciates the recognition for the need for increased investment in areas of science supported within the Division and is considering ways to strategically support the best science in a limited funding climate. It is anticipated that the outcomes of the IOS Scientific Workshop planned for September 2011 will include recommendations of value in this regard.

Other Topics

Recommendation: *Many of the current and future core priorities of IOS also have relevance to scientific and societal challenges such as predicting biological responses to environment and climate change, development of bioenergy, exploration of the genotype-phenotype map, understanding the brain and exploring biodiversity. Further efforts could be made to communicate the inherent connection between IOS priorities and these issues of broad societal and scientific relevance.*

Recommendation: *The CoV recommends increased efforts to effectively communicate outcomes to stakeholders and emphasize the accomplishments of NSF-funded research and education, especially the broader impacts and value to the general public.*

Response: In FY 2010, IOS began discussions with the NSF Office of Legislative and Public Affairs (OLPA) to develop a video and television programming focused on the organism in a changing world. To start the process, IOS committed \$100,000 to produce six television segments with NBC Learn focused on IOS-funded science. IOS has also recruited an AAAS Fellow, Dr. Michael Simon, who will join the Division in September 2011. One of his projects will be to work on IOS video and other public outreach activities.

Recommendation: ... to facilitate interdisciplinary investigator-initiated research, IOS should consider creative ways, including further Ideas Labs, wiki tools and workshops that could facilitate proposals and research ideas addressing specific aspects of key issues to make definitive progress on the core priorities.

Response: IOS is actively pursuing these tools to further science in priority areas. This topic will be a focus of the September 2011 IOS Retreat.

Division-Specific Questions

Recommendation: IOS should consider additional collaborations both within the Foundation (e.g. Polar Programs) and outside (DOE, NASA, DOD, NOAA, NIH, international funding agencies, and private foundations) to leverage opportunities for funding.

Response: IOS is exploring possible collaborations to leverage funding as the FY 2012 budget and FY 2013 budget request are developed. As discussed at the CoV meeting, international forums such as the US-EU Task Force on Biotechnology Research and the Joint Consultative Meetings held under S&T agreements provide unique opportunities to develop partnership programs. The NSF-Japan Science and Technology Agency (JST) joint Metabolomics program in which IOS partnered with MCB and DBI is an example of a program that developed through such discussions.

Recommendation: IOS should develop a “pet” grand challenge, which they take leadership to develop, drive and ultimately increase the amount of funded research; in essence one thing that IOS can rally behind and develop into a “sales pitch”. Such a grand challenge should be broad enough to allow the continuation of investigator-initiated projects. The goal is to provide a platform for increasing the funding available for the type of research currently being submitted by investigators and not redirect their research. The CoV believes that with recent organizational changes in the division and the current leadership the division is ready to undertake this challenge.

Response: Each year, the BIO Directorate usually holds the Leading Edge Discussion in which Divisions share examples of emerging scientific areas. In FY 2011, the Leading Edge Discussion was replaced by a discussion of the five grand challenges identified in the National Research Council 21st Century Biology Report. It has not escaped IOS's notice that all five of the grand challenges are directly connected to IOS science and the outcomes of the discussions will be used in the development of priority areas for the coming year.

Recommendation: *Potential encouragement to further interdisciplinary and integrative research could include travel and sabbatical grants that support interdisciplinary collaborations and mechanisms that bring IOS funded project directors together at NSF or professional meetings would increase the opportunity to develop interdisciplinary networking.*

Response: The annual Plant Genome Research Program and BREAD Program PI meetings are models for how annual PIs meetings can foster research connections as well as build communities. In FY 2012, IOS is considering the addition of travel funds to awards in key areas to support travel to a PI meeting at NSF or in association with a national conference, in addition to continuing to funding workshops and sessions focused on priority topics at annual society meetings.

Recommendation: *Attention to the documentation provided in the annual and final reports is key to capturing quality and impact of the research, and program managers need to insist on this material being provided in the reports.*

Response: IOS agrees that annual and final reports should be adequately documented and it is an IOS best practice to return reports that contain inadequate documentation. In this regard, it is worth noting that the Research Business Models Working Group under the National Science and Technology Council has led the development of new government-wide reporting modules that will be implemented on Research.gov. The Project Outcomes Report for the General Public, mandated by Section 7010 of the America COMPETES Act is required for all awards made after January 4, 2010.

Recommendation: *The CoV advises IOS to continue and increase in-house efforts to communicate the relevance of the supported research to issues of societal concern....The CoV encourages IOS to select dynamic discoveries like these for showcasing in museums, on television programs (Discovery Channel, PBS, children's programs), multimedia outlets. IOS should partner with the Directorate for Education and Human Resources for promotion of exciting science to the public.*

Response: As discussed above, IOS considers these efforts to be of high priority in FY 2012 and is exploring partnerships with other Directorates, including EHR.