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**OFFICE OF THE
ASSISTANT DIRECTOR
FOR MATHEMATICAL AND
PHYSICAL SCIENCES**

Date: May 16, 2013
From: Assistant Director, Directorate for Mathematical and Physical Sciences (MPS)
Subject: Response to the Division of Chemistry Committee of Visitor (COV) Report
To: MPS Advisory Committee
CC: CHE Senior Staff (DD, DDD), NSF Senior Management (OD, COO, CFO, CIO, OIG, OIA Director, NSF Committee Management Officer)

Please find attached the MPS response to the Committee of Visitors (COV) report from the Division of Chemistry COV Review (February 19-21, 2013). The review was thorough and insightful, and the findings will be very helpful to me and to the Division in fulfilling our responsibilities to the scientific community and to the nation.

The Division of Chemistry has drafted the attached response, and I concur with its contents. I therefore adopt it as the official response of the MPS Directorate. The required Diversity and Conflict of Interest Report is appended to the end of the CHE Response. I hope the full MPS Advisory Committee finds this COV review and the MPS response useful.



F. Fleming Crim
Assistant Director, Directorate for Mathematical and Physical Sciences

Attachments: Response of the Division of Chemistry to the 2013 COV Recommendations
2013 CHE COV Report

CHE Response to the 2013 Report of the Committee of Visitors May 2013

The Division of Chemistry (CHE) wishes to thank the members of the 2013 COV panel for their time and effort on the review of the activities of the Division. We are especially grateful to Dr. Joseph Francisco for his exemplary leadership during the COV process, resulting in the timely completion of the final report.

We are very pleased with the thorough review and the realistic, actionable recommendations. We are delighted that the COV panel recognized the Division's devotion to a thoughtful and fair review process and are very pleased with the high marks the Division received. In the following, we respond to the specific recommendations in the same order as presented in the executive summary of the report. If deemed necessary for clarification, passages from the full report are quoted.

"Recommendation #1: Find mechanisms to further increase the efficiency and efficacy of the review process. These efforts should include establishing a database of reviewers and developing mechanisms for educating the reviewer pool on the importance of substantive reviews and reviews that provide constructive advice to PIs. An essential aspect of this recommendation is to increase the clarity, transparency and integrity of the review process, particularly with respect to communication to PIs. Two examples are transparency in identification and development of priority research areas and clarification of broader impacts. The Broader Impact criterion is an important component of competitive proposals, but there remains misunderstanding on what it is and how it is used in evaluation. Moreover, evaluation of the broader impact component should be consistent across programs of the Division. Finally, the Chemistry Division should continue its efforts to ensure that the composition of review panels is as diverse as possible, including members with high levels of research activity and breadth, as well as young PIs."

"...establishing a database of reviewers"

The Division took leadership in evaluating commercial reviewer database software, beginning in fiscal year 2010 (FY10). Note that the existing database is not searchable, but does allow program directors to view the NSF review record of individual reviewers. The Division's initial effort resulted in a request for bids for the acquisition and installation of a more advanced database. Most likely driven by NSF's requirements on security and confidentiality, no bid was deemed acceptable by NSF; in a second round, no bids were received. CHE revisited the issue in late FY12, with continuing efforts in FY13. The issue was elevated to a higher level. NSF's Chief Information Officer is strongly supportive of such a database, cross-linking with NSF's existing electronic business applications. The cost for this endeavor is considerable and requires approval and buy-in at all levels. Despite the current fiscal uncertainty, CHE is optimistic that such a database will be established on an NSF-wide level, but establishing it may take some time.

"... developing mechanisms for educating the reviewer pool"

CHE strives for continued, clear communication with the principal investigator (PI) community. Given the recent federal travel restrictions, we have reached out to the community by offering virtual participation at chemistry department meetings. We

advertise this opportunity in our Newsletters, at panels, on outreach trips, and in one-on-one conversations with community members. Surprisingly, the interest by academic departments has been rather small (about 5 requests in calendar year 2012), but we will continue our efforts to communicate this opportunity. We use these venues to communicate priority research areas, provide coaching, mentoring and training in reviewing and writing proposals, conduct special training sessions for early career investigators, and answer specific questions, such as the recurring one on the balance of Broader Impacts versus Intellectual Merit.

"...transparency in identification and development of priority research areas and clarification of broader impacts."

A recent task force of the National Science Board was charged to review and revise the NSF Broader Impacts criterion that continues to cause misperceptions in the community. The task force made specific recommendations that were implemented in the latest Grant Proposal Guide, and added to the guidance provided to reviewers.

"...evaluation of the broader impact component should be consistent across programs of the Division"

NSF does not provide guidance to the reviewer community on the relative weight of Broader Impacts and Intellectual Merit, nor is strict consistency feasible or desirable, given the diversity in types of proposals received (what's appropriate for a Center may not be appropriate for a CAREER proposal). This naturally leads to a wide spectrum of reviewer responses. CHE program directors very carefully analyze the merits of a proposal with regard to both criteria. While proposal outcomes are largely determined by reviewer feedback, program directors also consider portfolio balance in their recommendations. The convolution of both aspects appears to have raised the perception by COV members that the relative weight of both criteria was inconsistently applied across programs. While we note that this is sometimes warranted given differences in the nature of our programs, the Division will enhance its efforts to more consistently document this process.

"...composition of review panels is as diverse as possible"

In the full version of the report, the COV recommended that the identity of panelists be made public as is practice at the NIH. The rationale for the recommendation was two-fold – allow the PI community to be assured that the correct expertise is present at the review panel, and assure that conflicts of interest (COI) are addressed.

The issue raised by the COV pertains to NSF as a whole, and the change of NSF policies is not under the purview of CHE. It is NSF's policy to keep the review process strictly confidential as NSF believes that only anonymous merit review ensures reviewers' candor.

We point out that NSF panels are covered under the Federal Advisory Committee Act (FACA), so the identity of panelists in the annual pool is disclosed on a public website (see <http://fido.gov/facadatabase/>). Because NIH's portfolio is mission-oriented, there is greater homogeneity in the proposal and reviewer pool, and larger panels. The large panel size coupled with term membership help to conceal the source of individual comments.

In addition, we would like to reaffirm that COIs are taken very seriously at NSF and every proposal is thoroughly screened for potential conflicts before it is released to a reviewer or panelist. Reviewers and panelists are asked to disclose additional conflicts that cannot be identified by NSF (such as personal friendships or inadvertent omissions in the list of collaborators provided by the PI). Every panelist must sign a conflict-of-interest and confidentiality form before being allowed access to proposal, and individual reviewers indicate their consent to these terms before being granted FastLane access.

Lastly, the COV recommended that young investigators be included in the review process. We would like to emphasize that we do so whenever possible, as we regard panel service and ad-hoc review as a learning experience to improve grantsmanship and as a career-building opportunity. However, we are mindful to balance seasoned and new reviewers, and to include only young investigators who have sufficient experience to serve on a panel.

"Recommendation #2: Maintain continuity of Program Officers in programs over a period of time."

The COV's concern was lack of continuity in programs staffed by rotating program directors (PDs). Currently, the Division has about 60% permanent and 40% rotating PDs, which we consider a healthy balance. While our permanent PDs provide the desired continuity, the rotating PDs bring in fresh ideas and are more closely in touch with the issues concerning researchers in the scientific community. Nevertheless, we agree with the COV that some of the programs were subject to frequent personnel changes due to difficulties in hiring and delays in on-boarding new rotators. Rotators under consideration for hiring cannot have any proposal in "pending" status, or submit new proposals. The Division has implemented a working group that is charged with developing a robust plan that merges continuity and scientific breadth, with the additional constraint that the Point of Contact (POC) or Program Lead be a permanent staff member. The plan will also address succession planning.

"Recommendation #3: Increase the efficiency of operations and the number of Program Officers to improve program management. The COV recommends that the Division be given positions for additional personnel in order to decrease the workload currently imposed on Division staff, to ensure adequate oversight and program management, and to allow progress on new and existing programs and projects."

We are delighted about this recommendation as we wholeheartedly agree that there is a need. In fact, every year when the divisional workforce analysis is undertaken, we request additional program director positions. Unfortunately, they are available neither to us nor to MPS, and implementation of this recommendation is out of our hands.

"Recommendation #4: Reevaluate the distinction between the catalysis and synthesis programs and investigate best ways to categorize the programs in these areas."

We have established an internal working group to tackle this issue. Our first step is to mine data. We are in the process of identifying proposals where the topical fit to either of the programs was unclear, be it externally (to the PI) or internally (to a program director). The next step is to look for commonalities in such scientific topics, to guide us in the process of redefining the programs.

Armed with these data, we will revisit the program descriptions, including those of other NSF entities such as the Catalysis and Biocatalysis Program in the Engineering Directorate. We will then decide if a revision of the program descriptions will suffice to clarify the distinction, or whether the SYN and CAT programs should be restructured, necessitating further community input.

"Recommendation #5: Reevaluate the timing of the submission windows."

The report states "The present schedule, which has proposals submitted during the months of September and October, can cause problems for academic departments, many of which start their academic years in late August or early September."

The move to one submission window was driven by the fact that although we previously had two *submission* windows, we effectively had only one *decision* window, due to misalignment with the realities of the federal budget process. Our choice of submission dates was partially guided by aligning our window with those of other Divisions, which facilitates co-review. For example, the Division of Materials Research (DMR; one of our regular partners in co-review) has a submission window that spans the months September/October, and we scheduled the window for our MSN (Macromolecular, Supramolecular and Nanochemistry) program for October, in order to best align with DMR's window.

At this time, we feel it is unwise to change the window, as we had a significant change in the last fiscal year (i.e., a move from two to one submission windows) and we fear that a second adjustment will create confusion in the community. We will continue to collect feedback from the community and reassess this issue in fiscal year 2014.

"Recommendation #6: Commission a National Academies review/study of the Re-alignment of the Chemistry Division. The composition of the review should represent a broad cross-section of the chemistry community (i.e. industry, government laboratories, and universities). The COV has provided specific scope questions to guide the assessment."

We appreciate the thorough discussion and the many guiding questions that the Committee suggested. We further agree that a thorough assessment will include many stakeholders, including, as noted in the report, "PIs, reviewers, program officers and the broader community."

The COV felt that it was necessary to involve assessment professionals in the design of the study. The Division wholeheartedly agrees. While some of the questions can be answered by mining internal data, many of the guiding questions involve external stakeholders that would be best engaged through surveys. The Division plans to address this recommendation in the coming fiscal year, with a high priority on identifying the proper entity to conduct such a study in a credible, objective, and cost-effective way.

"Recommendation #7: Work to increase ... industrial partnerships. The division should consider (a) using Centers to even more effectively ... bring about university/industry engagement, and (b) examining best practices at NSF to help facilitate faculty/industry partnerships using NSF-facilitated internships. It is important that the strength in fundamental research in the chemical sciences continue to further innovation, and the Chemistry Division can provide leadership to the community in identifying and promulgating successful industry/university collaboration mechanisms."

We have established an internal working group that is charged with identifying stakeholders and developing a process that allows us to develop such an initiative in an informed way. Currently, NSF CHE engages with industry through GOALI ([Grant Opportunities for Academic Liaison with Industry](#)), I-Corps ([Innovation Corps Teams](#)), and our CCI ([Centers for Chemical Innovation](#)) programs. Moving forward, we will also consider other NSF models for industry partnerships, such as those facilitated by the "Industrial Innovation and Partnerships" program in NSF's Engineering Directorate.

"Recommendation #8: Explore ways to increase global engagement of the chemistry community, especially faculty and students involved in projects in other countries. CHE should seek to enhance participation in international collaborations by creating a chemical research world network of partnering agencies who share the CHE vision of a joint proposal-joint review-joint funding recommendation-parallel funding model. Exploring best practices from the Materials World Network (DMR) could provide direction on how to be effective in increasing global partnerships by the Chemistry Division."

CHE has a very active international program ("International Collaboration in Chemistry") that has developed over the years to include a growing number of countries. It uses precisely the outlined model of collaborations between partnering agencies. The program has reached a level of maturity that allows us to re-assess the current modus operandi, with the goal of maximizing its global impact while minimizing bureaucratic burden on investigators and funding agencies.

In addition, an NSF-wide program "Science Across Virtual Institutes" or SAVI was recently launched. SAVI provides a mechanism for U.S. research communities to build long-term, structured collaborations with partnering countries in STEM fields. We expect interest in this funding mechanism to grow in the chemistry community as we continue our outreach efforts.

Diversity and Conflict of Interest Report

The Division of Chemistry held its triennial Committee of Visitors (CoV) on February 19-21, 2013. The CoV was composed of 26 members from the scientific community chosen for their scientific expertise and awareness of developments in their respective fields of the chemical sciences, as well as a sense of issues, perspective, and balance across the chemical sciences. The 26 CoV members composed a diverse committee with respect to geographic, institutional, gender, ethnicity, age, private sector, and scientific representation. The table below describes the main features of the CoV with respect to these issues. Note that some of the demographics are self-reported and may not add up to 26.

The CoV was briefed on issues of Conflict of Interest for the purpose of one of the CoV's statutory responsibilities, namely the reading of proposals, reviews, and recommendations, and commenting on the handling of actions and the appropriateness of recommendations. Each CoV member completed an NSF Conflicts of Interest form. Known conflicts of interest, such as those involving the home institutions of CoV members were entered into the Electronic Jacket Committee of Visitors system prior to the start of the meeting. Other conflicts of interest were entered as they became known over the course of the meeting. Entering these conflicts of interest prevented CoV members from electronically accessing proposals with which they were conflicted. None of the CoV members was involved in the review of a program in which he or she had a pending proposal. The CHE COI officer was available at all times during the CoV meeting to answer questions and resolve issues regarding conflicts of interest.

<u>Ethnicity</u>		<u>Geographic</u>	
Hispanic	5	Rocky Mountain RM	1
Not Hispanic	19	Mid East ME	7
		New England NE	2
		Far West FW	3
		Plains PL	1
		Great Lakes GL	6
		South East SE	5
		South West SW	1
<u>Race</u>		<u>Public/Private</u>	
White	17	Public	15
Black or African American	2	Private	6
Asian	1	Other	5
Native American	1		
<u>Gender</u>			
Female	15		
Male	11		
<u>Institution Type</u>			
FFRDC	2		
Industry	1		
PhD	16		
PUI	5		
Other	2		