

Division of Chemistry (CHE) Response to Findings and  
Recommendations of the Committee of Visitors  
February 7-9-2007

The Division of Chemistry is grateful to the COV for their thoughtful work and participation, and especially to Geri Richmond, the Chair, for her leadership. The engagement of all participants was evident, the environment was open and the process proceeded with the highest integrity. CHE thanks Morris Aizenmann for serving as the COV monitor on behalf of MPS, and MPS leadership Tony Chan and Judy Sunley for their advice, participation and receptivity.

1. The COV urged CHE to develop a Strategic Plan to guide the Division over the next few years as well as further into the future. The vision for the Strategic Plan is broad and includes intellectual pursuits as well as workforce development, tool development and organizational excellence. The COV urged CHE to include topics such as: scientific goals and benchmarks to allow measurement of progress, how to better articulate the high value of the current research that is being done, goals for the chemical workforce including students, postdoctoral fellows and the professoriate, goals for grant size, grant duration, number of grants and special funding modes such as SGERs and Creativity Extensions, guidelines to determine the optimal mix of single investigator grants and other modalities such as small groups and centers, goals for Division staffing and succession planning, and a plan for broadening participation of under-represented groups in all Division activities. The COV also urged CHE to consider a strategy for continued improvement and transparency of merit review: recruitment of diverse and competent reviewers, educating reviewers about programs and NSF review criteria, educating PI's about merit review, and the training and mentoring of program officers. The COV also urged CHE to include a strategy for robust support for instrumentation and instrument development, assessment of effects of the loss of cost-sharing, and education of the community about instrumentation issues and opportunities.

The COV urges CHE to develop and implement assessment tools as part of the Strategic Plan. These would be applied to assess new programs such as the CCIs, CRCs, CRIFCyber, and URCs. The COV recommends that CHE assess the use of the "Broader Impacts" review criterion by reviewers and program officers, and assess the success of the broader impacts aspects of funded work. With the new submissions windows for unsolicited proposals, the COV would like to see an assessment of how the new structure works out for the community and the Division.

Finally, the COV urges CHE to consider its strategic partnerships, such as with other disciplines and with other countries.

RESPONSE: The Division of Chemistry agrees that developing a Strategic Plan is an excellent idea. The Division Strategic Plan will align with those of the NSF and the MPS Directorate. The Division will produce a timeline within one month for the steps to be taken in formulating the plan. The vision is that there will be a great deal of community input (e.g. Town Halls and a website open for comments from the public). The Division

leadership has already contacted the NIGMS to coordinate with their current strategic plan exercise. Since the time of the COV, the Division's "Plan for Broadening Participation" has been approved by the NSF administration for public distribution, and this will become part of the Strategic Plan. CHE aims to complete its Strategic Plan by the end of 2007, and will attempt to make significant progress in achieving the goals by the time of the next COV in 2010.

**FY2008 Response:** The Division of Chemistry has moved promptly to draft *Strategic Directions: 2008-2012* that is currently available for review by the community. Eight critical issues were identified using a SWOT analysis and extensive community input via Town Halls, Dear Colleague Letters, the web and comments via email. These critical issues include advancing American competitiveness, communicating the value of chemistry and chemical research to the public, increasing global engagement, increasing grand challenge research through centers, broadening participation, addressing funding needs of investigators across career stages, assessing the impact of the broader impacts review criterion, and updating the Division of Chemistry structure.

The Division's Plan for Broadening Participation is an important and integral component of *Strategic Directions: 2008-2012*. We expect that *Strategic Directions: 2008-2012* will be finalized no later than September 30, 2008.

2. The COV recognized that the ability to tackle transformational fundamental chemistry is being severely compromised by the shrinking dollar in CHE grants. There is a sense in the report that the grant size (and therefore the supported research group size) is subcritical.

RESPONSE: This is a serious matter and the Division recognizes the problem and the challenge. This will be addressed in the Strategic Plan.

**FY2008 Response:** *Strategic Directions: 2008-2012* recognizes the challenges of optimizing our investments considering grant size, duration and success rate. Programs may consider the use of Small Grants for Exploratory Research (SGERs) and Creativity Extensions to encourage potentially transformative research. The new funding modality of the Centers for Chemical Innovation was developed specifically to address grand challenge, potentially transformative research.

3. The COV strongly endorsed the continued emphasis on single investigator grants. The COV warns that new funding modalities such as Collaborative Research in Chemistry (CRC) should be watched carefully so as to not erode the single investigator grants. On the other hand, some members of the COV believe that the establishment of centers may be one way to expand Chemistry's reach, a goal that all supported provided that single investigator grants are not eroded.

RESPONSE: The Division is sensitive to the community's concern about preserving the single investigator "core" but is also sensitive to an increasing number of younger PIs who favor research work in small and large groups. The current plan is to continue to

offer the community the possibility of submitting the best scientific ideas in all areas through one of three modalities: as single investigators, as small groups and as larger groups (in centers). The ultimate balance of these three funding modalities will be monitored closely but it will be determined by proposal pressure and quality and thus by the chemistry community. The Division believes that increasing the number and nature of interdisciplinary centers is important, both to provide strong scientific synergism and to increase the Division's ability to increase its funding level. Increasing the number of chemistry centers will only be considered if budgets grow so as not to erode existing single investigator grant support. The issue will be carefully addressed in the Strategic Plan.

**FY2008 Response:** The Division remains firmly committed to supporting small collaboratives as part of our core research activities. As part of our "Structure" discussion in *Strategic Directions: 2008-2011*, the Division has decided to transition collaborative research into the disciplinary research programs and discontinue special solicitations for collaboratives. Future COV's will be asked to evaluate the Division's internal processes to ensure that both individual and collaborative proposals receive a thorough and fair review and that the disciplinary programs are maintaining a healthy the balance of individual and collaborative awards in the portfolio.

4. The COV very strongly recommends that the Division examine its written feedback to the PIs and improve the communications so that the PIs, especially ones that are declined, have enough information to improve their proposals. The COV repeated the advice from the 2004 COV, namely that some version of the Review Analysis be sent to the PI. The COV repeated the criticism of the 2004 COV that some panel summaries were inadequate and the value-added of panels was questioned in some cases.

RESPONSE: The Division will look into the matter of sending "Program Officer Comments" or a version of the Review Analysis to the PIs (edited to remove confidential or sensitive information). There are workload issues that are associated with writing "Program Officer Comments" (these would have to be quite carefully written due to sensitivity, confidentiality and legal reasons), and the idea will be re-examined now that the present staffing structure is somewhat improved over that in 2004. The Division will address the criticism related to panel summaries and will implement new measures (in addition to those undertaken after the 2004 COV) to improve the quality and depth of these documents. The Division will carefully scrutinize the use of panels to be sure there is value-added.

**FY2008 Response:** A few CHE programs will pilot the use of "Program Officer Comments" in Spring 2008 to provide timely and useful feedback to the PI. Community response and PI workload impacts will determine if this is an effective communication tool. All Program Officers remain committed to clear and open communication with their PIs and encourage direct PI-PO conversations via email, telephone and in-person visits.

5. The COV repeated the 2004 COV opinion that the Broader Impacts review criterion is sometimes not addressed and there is confusion about it on the part of the PI's and the reviewers. They said that further education by CHE and MPS is essential to clarify what

is meant by Broader Impacts, and how broadening participation plays in.

RESPONSE: CHE has tried very hard to inform the chemistry community about Broader Impacts, including a symposium held at the National ACS Meeting in Washington DC in August of 2005 and a page on the CHE web site. The Division will continue to develop outreach and disseminate the materials that have been prepared to educate the community about Broader Impacts, including broadening participation. CHE has led and will stay involved in the conversations throughout the Foundation about the Broader Impacts criterion and broadening participation, and will examine this important issue in its Strategic Plan.

**FY2008 Response:** CHE has launched a pilot assessment of broader impact activities. We expect that this assessment will inform both the division and the community. CHE has also provided an updated Dear Colleague letter (NSF 08-044), sample Highlights focusing on Broader Impacts, and other materials.

6. The COV strongly supports the Research Experience for Undergraduates Program and the Instrumentation Programs, and believes that the Instrument Development Program should be augmented.

RESPONSE: The Division agrees with the COV about the importance and impact of the REU program and increased the level of support for FY 2007 substantially. Future budgetary increases will be considered. CHE will also respond to proposal pressure in the Instrument Development Program and continue to fund meritorious proposals with budgets deemed appropriate by the reviewers and Program Officers. CHE will develop outreach with regard to advertising the Instrument Development opportunities.

**FY2008 Response:** Instrument Development continues to be an exciting and productive area for CHE. A workshop focused on identifying opportunities for instrument development at the chemistry-biosciences interface is planned for summer 2008. This workshop is cosponsored with NIH and the NSF Division of Biological Infrastructure.

The Division maintains its strong support of the REU Program. A growing part of our REU portfolio is international REU Programs (iREU). In FY08, we are supporting six international REU Programs, sending 60 US students to great research opportunities in eight different countries.

7. The COV is in favor of increasing the number of on-site permanent Program Officers.

RESPONSE: We are in the process of selecting 3 (maybe 4) permanent program officers and that will increase the number to 8 (maybe 9), essentially half the total number of program officers. The Division will consider increasing the number of permanent program officers by an additional 1-2 in the future, but considers a 50:50 ratio of permanent:rotator to be a good initial goal. The present focus is having Program Officers on-site (versus off-site at their home institution) so that the Division can provide leadership in the many interdisciplinary and cross-cutting activities in the MPS.

FY2008 Response: CHE was able to increase the number of permanent program officers to eight over the past year and is currently advertising for additional permanent staff. We continue to seek excellent chemists as rotational and permanent CHE staff.

8. The COV challenged CHE to achieve 80% of proposals finished in 6 months.  
RESPONSE: Bring it on!

**FY2008 Response:** CHE is delighted that it was able to meet this challenge in FY2007, finishing 82% of its 1579 actions in less than six months.