

Division of Chemistry Response to the FY 2010 Committee of Visitors Recommendations

Update November 2011

FY11 Updates are inserted under each of the specific recommendations together with the original response from 2010.

Specific Recommendations and the CHE Response

□ *The COV recommends that CHE senior staff members continue to stress the importance of investing in Chemistry as a core discipline by highlighting major accomplishments resulting from CHE investments. The previous support of a half-time science writer for press releases was viewed positively, and this, or a related mechanism, should be explored.*

Original Response 2010

CHE agrees that publicizing the outcomes of NSF investments is essential and the Division is committed to finding ways to effectively achieve this goal. CHE and MPS have been developing a staffing plan. The first CHE priority is to increase the number of Program Directors, but we agree that a skilled science writer would be an asset to the Division. In the meantime, CHE staff will continue to work with the NSF Office of Legislative and Public Affairs to publicize the successes of CHE-supported projects.

Update 2011

The long-term plan for administrative workforce development in the Division is to move from program assistants to program analysts. Science writing skills could be included in the performance plan of program analysts if the position is advertised accordingly. While we maintain our close collaboration with the Office of Legislative and Public Affairs, we agree with the COV that such talent within the Division would help us publicize chemistry to a more general audience.

□ *The COV recommends that the IIA research project budget continue to grow at a rate that ensures a high level of productivity from the best laboratories across the U. S. The Division should encourage the growth of Centers as funds become available without compromising the IIA budget. The Division Director should be commended for his efforts*

Original Response 2010

The Division will continue its best efforts to articulate the exciting opportunities in chemistry research for individual investigators and small teams and to support Grand Challenge research through centers. The balance of investments will continue to be carefully monitored. The Division is committed to outreach to the CHE PI community and continues to discuss new ways to be more effective, including events at major meetings.

Update 2011

The Division has requested a significant increase for both the FY13 Centers budget (\$29.25 million, from \$24 million in FY11) and the individual investigator (IIA) core (\$160.5 million in FY11 to \$185.2 million in FY13 under the scenario of a budget increase). In FY11 the Division absorbed a 0.4% budget cut. The Centers program budget change relative to FY10 nevertheless increased by 1%, reflecting the Division's commitment to protecting this activity.

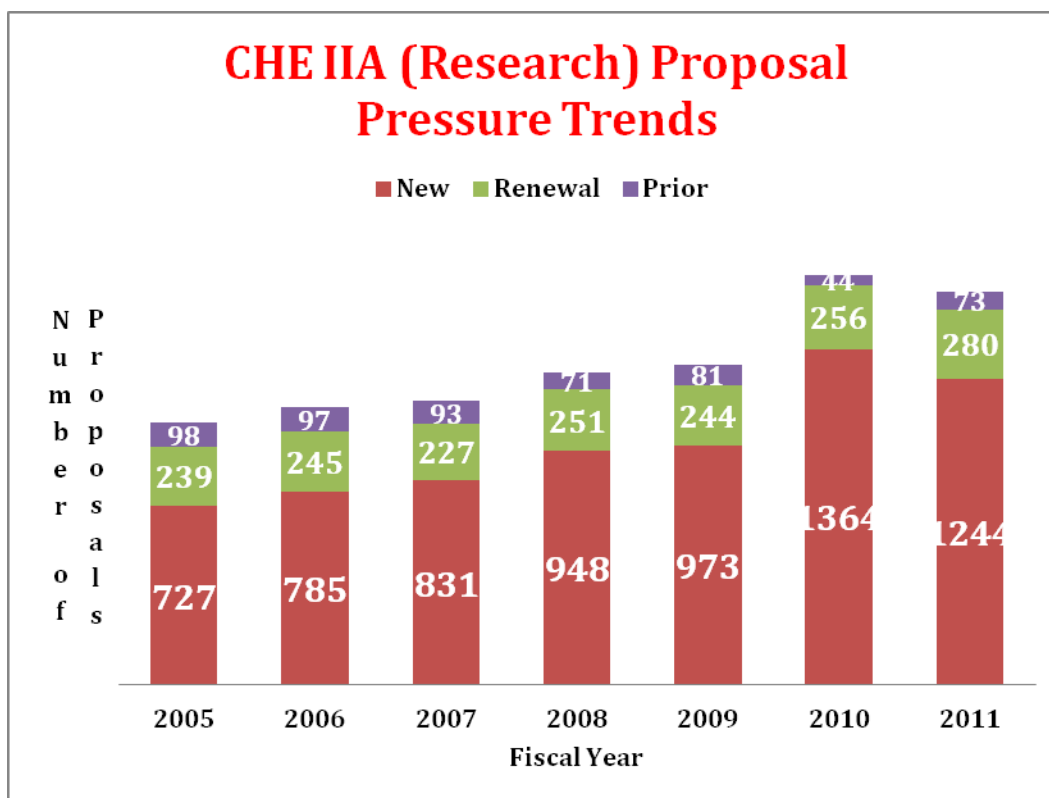
□ *The COV recommends that CHE place a priority on growing the size of the average IIA toward \$200K per year (from the current \$144), despite the fact that this might lead to a lower success rate initially. Like other members of the community, the COV members are encouraged by the efforts to double the NSF budget in the next 10 years, and it is hoped that this growth will permit increased grant sizes without decreasing the number of individual grants in the portfolio.*

Original Response 2010

CHE agrees that increasing the award size is a high priority, assuming increasing budgets. As an immediate first step, CHE staff will develop models under various scenarios of Divisional budgets, proposal pressure and award sizes to understand the potential impacts on the CHE portfolio and the community. CHE will report on this first step in the 2011 update.

Update 2011

In FY11, the median award size grew from \$131.3 k/a in FY10 to \$132.5 k/a, while the mean size decreased from \$156.9 k/a to \$147.8 k/a. A mean larger than the median suggests that there are more awards on the lower end of the spectrum, while the decrease in the mean and increase in the median reinforces the shift to more awards of smaller size – a trend opposite to that the COV desired. Nevertheless, this allowed CHE to keep the funding rate constant. It should be noted that this distribution is to some extent the direct result of the number of submissions: while the number of renewal proposals submitted has been more or less constant for the past 6 years, the growth in proposal pressure is almost exclusively attributable to new submissions, which correspondingly resulted in an increase in the absolute number of new awards (see the figure below). It should also be noted that in FY11 the renewal success rate was 55%, while that of new proposals was 15%. If we increased the annual budget of renewal proposals to \$200 k/a and absorbed this increase only by affecting the funding rate of renewals, the latter would drop to 24%. This means that about 50% of our PIs with renewal requests (most likely including many of our COV members) would not have received funding in the last cycle.



□ The COV recommends that the success rate of applications be monitored across different career stages for PIs to ensure that we do not lose more seasoned, yet highly productive and innovative investigators from the long-term pipeline.

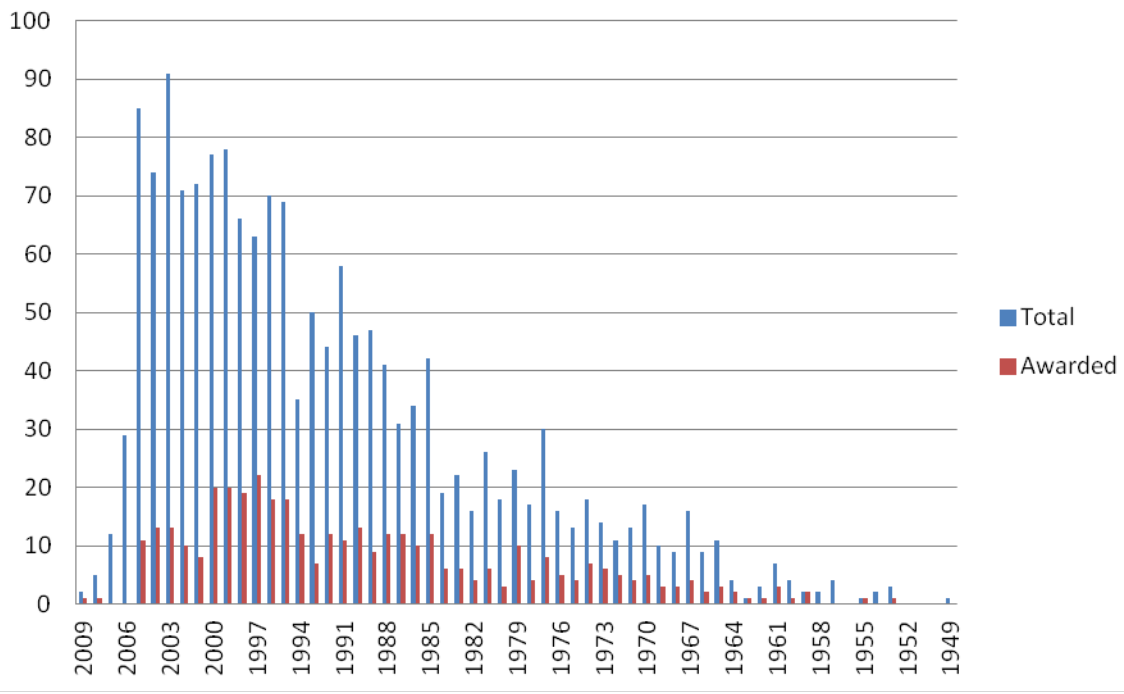
Original Response 2010

CHE agrees that it should pursue this element of the Strategic Directions Document. CHE staff will examine the research projects portfolio by PI career stage and report our analyses in the 2011 update.

Update 2011

The figure below shows the success rate for PIs at different stages of their career, plotted as the number of proposals submitted (blue, “Total”) and the number of awards made (red, “Awarded”) versus the number of years that have passed since attainment of the Ph.D. degree. The figure clearly shows that no age group ten years past Ph.D. is over- or underrepresented in receiving NSF CHE funding (CAREER proposals have a somewhat lower success rate than the overall population, but of course there are no renewals in this cohort!). More senior PIs have slightly higher success rates, which is expected (existing track record, experience in grantsmanship, name recognition by the community) and also reflected in the larger success rate for renewal proposals (see above).

CHE PIs PhD Years - FY10



□ *The COV recommends that CHE explore additional mechanisms for review that might increase the efficacy of the process and increase the scientific value of the reviews. Ideas might include (1) use of cyberconferencing and panels outside of Washington to lower costs and relieve travel time for reviewers, (2) inform ad hoc reviewers that their reviews will be read by a panel, (3) develop a more robust database for searching, assigning and tracking reviewers, including opt-in/opt-out responses similar to journals, and (4) hire more program officers! The COV noted that NIH has undergone substantial changes to their application and review processes over the past two years as a result of a system wide study. Some of the lessons learned at other agencies might be useful to NSF staff in this regard.*

Original Response 2010

These are all interesting suggestions that could improve the efficacy of the review process. CHE has been using telepanels and cyberconferencing in some situations and will look for opportunities to increase their use. CHE staff will explore the idea of regional panels. There are NSF-wide groups looking at several of the broader reviewer questions, including new tools to identify reviewers and to manage the review process. CHE staff has been and will continue to be actively involved in these efforts. CHE will continue communicating with other federal funding agencies who have recently experimented with various review initiatives to learn the benefits (and unexpected pitfalls) of each approach.

Update 2011

Telepanels:

CHE uses telepanels for very small panels in the CRIF program (e.g. for ESR and diffraction related proposals). In addition, we offer the option to participate via Skype if a panelist cannot travel for personal reasons, or simply prefers to work from home. Typically, not more than one panelist per panel has taken advantage of this option. The general agreement by panelists and NSF staff is that the face-to-face interaction is invaluable. In addition, the technology does not yet operate flawlessly to ensure smooth operations of telepanels. Hence, the Division is not ready to move exclusively to telepanels.

A CHE subcommittee consisting of the DDD, OS, and PSM met with the lead of the MPS IT group to discuss technology options, and the consensus from this meeting is that the technology to conduct large panels flawlessly via teleconference is not yet up to the desired standard (this is mostly related to bandwidth). The recommendation by our IT group is to use the telephone for audio as the sound quality of platforms such as Skype is typically not sufficient for uninterrupted communication, especially when more than one remote party is connected. This puts a lot of strain on the panelist who has to hold a telephone in their hand for the duration of the panel (often two days).

Panel Cost Reduction Measures:

Finally we would like to note that the Division spends about half a percent of its annual budget on panels; a cost that we feel is outweighed by the benefits of an on-site panel with face-to-face interaction. However, to reduce the cost further we are no longer providing laptops to panelists unless requested. Experience has shown that most panelists prefer to bring their own laptops and the subcommittee received assurance from the MPS IT group that full support is available for panels where predominantly personal laptops are being used. The savings per panel are not significant (about 3% of the total panel cost) but the Division feels that the benefit of saving on an unnecessary expense outweighs the small increase in administrative staff workload. The MPS IT group welcomed this decision.

Increasing the Efficacy of the Review Process:

The Division has made efforts to streamline the review process and to reduce reviewer and NSF staff workload. A recently introduced model allows program directors to triage proposals from discussion in panel. At the beginning of each panel, the panelists jointly agree to triage certain proposals, and any panelists can request that any proposal be excluded from triage. This allows the panelists to spend more time to discuss competitive proposals, and provide more in depth recommendations to NSF staff. A further increase in efficacy is achieved by allowing template review analyses for non-competitive proposals (e.g. proposals triaged at panels, or proposals with consistently low ratings in their ad-hoc reviews). Nevertheless, NSF staff will provide detailed comments to the PI (using the "PO Comments" function in eJacket) so that the PI has sufficient feedback to understand the program's rationale for a declination, and to revise the proposal accordingly.

Review Process:

The NSB tasked a working group to analyze current review practices. The resulting preliminary report (about 100 pages in length) summarizes the results of pilot projects in the review process that have been conducted over the years. The Division is using these data to assess our review process. We have support from the MPS Front Office to conduct pilot programs, and we are currently discussing options.

Database to Identify Reviewers:

Two Program Directors from CHE and DMR spent almost a year working with DIS to secure a commercial database to help the program directors identify reviewers, based on information entered by the PI. These types of databases are commonly used by journal publishers. Unfortunately, the constraints imposed by DIS were so tight that no bids were received.

□ *The COV recommends that CHE continue to educate the community through the current mechanisms, but also explore other ways in which PIs and reviewers can be informed about best practices in terms of Broader Impacts. It is important for NSF to work to clarify the intent and meaning of the criterion. Ideas might include (1) sending the Broader Impacts web link shown above to reviewers, or (2) developing a voluntary on-line tutorial for PIs and reviewers. In addition, program officers should continue to work together to form a consensus for those borderline applications where intellectual merit and broader impacts appear to be valued differently by the reviewers. POs need to be clear in documenting declinations about how the reviews of the two merit criteria led to the decision that was made.*

Original Response 2010

The Division will seriously consider these suggestions as we further work with the community to encourage more consistent evaluation of the broader impacts of a proposal.

Program Directors strive to interpret, balance and integrate different, sometimes contradictory, reviewer comments on both Intellectual Merit and Broader Impacts. This is a longstanding challenge and the focus of much of our staff training and programmatic discussions. CHE Program Directors will continue their efforts to clearly articulate key decision factors in the review analyses and in their communications with the PIs.

Update 2011

The Division has heightened its efforts in reaching out to the community. Through our Newsletter and other channels (e.g. outreach visits, panels) we constantly inform the community that we are willing to skype into their Department meetings. Our goal is to conduct one such conference a week, with an annual goal of connecting with 50 departments. The advantage of

this approach is that we can reach faculty from institutions in remote locations, new investigators who are not captured by our email list, and faculty who cannot afford to travel to or choose not to attend ACS national conferences where we hold Town Hall Meetings. The Skype venue allows us to discuss questions on the Broader Impacts criterion directly with the reviewer community. It should also be noted that an NSB task force is currently reviewing NSF's evaluation criteria. A suggestion to align broader impacts with certain areas of national priority met sufficient community resistance to drop this plan. The NSB task force is revisiting the issue, and we are awaiting updates.

□ *The COV recommends that a study by CHE to assess the proposal use of and reviewer evaluation of broader impacts be implemented in order to provide feedback on this challenging problem. Such a project was initiated by CHE already, but the company conducting the study folded and conclusions could not be reached.*

Original Response 2010

This is a critical issue for all of NSF. The National Science Board has recognized this and is taking a leadership role. At the May 4-5 Board Meeting (concurrent with the CHE COV), the Board approved the charge and work plan for a Task Force on Merit Review that has been explicitly asked to address this point. CHE will seek opportunities to partner with the Board and other NSF groups to address reviewer evaluations of broader impacts.

Update 2011

See above.

□ *The COV recommends that the division (1) reassess and update the Strategic Directions document periodically, (2) evaluate and refine the new interdisciplinary programs as needed, and (3) continue to educate the community about the new programs, for example, by broader distribution of the new brochures that describe the realignment.*

Original Response 2010

The COV was briefed on issues of Conflicts of Interests and each COV member completed an NSF Conflicts of Interests form (NSF 1230-P). This allowed the COV to complete one of their charges: to examine proposals, reviews and internal documentation and to comment on the integrity and efficacy of processes used to solicit, review, recommend, and document proposal actions. Where COV members identified conflicts-of-interest or the *appearance* of conflicts-of-interest, they disclosed them to their fellow COV members, did not access the electronic files related to particular proposals or actions, and left the room during discussions of that proposal or action. Access to the electronic file was blocked for all identified conflicts-of-interest.

The Division of Chemistry believes that the COV and its chair, Dr. Cynthia Burrows of the University of Utah, conducted their review and discussions with the highest standards of integrity and professionalism. The Division staff detected no situations in which conflicts-of-interest were not handled properly. The Division is pleased with the quality and thoroughness of the COV report, its findings, and its recommendations.

CHE agrees that FY 2011 is an opportune time to update *Strategic Directions: 2008-2012* and will seek input from the staff, the new Division Director, the MPS Advisory Committee and members of the CHE community. One critical aspect of the updated Strategic Directions Document will be a framework for evaluating the new programmatic structure. CHE acknowledges that the new programmatic structure may need changes and adjustments; some programs have already made minor revisions in their program descriptions and we expect this evolution to continue. Several programs have held (or are planning to hold) workshops and PI meetings that will also serve to better articulate the program goals, activities and boundaries.

Programs near disciplinary boundaries are exploring methods to best support science at the new interfaces, including creating new positions that bridge divisional boundaries.

Note Added 28 June 2010

In the Chemistry Education Program Review, page 76 Section A.2.4 the statement is made “REU: A uniform # of reviewers is recommended not just 2 (and preferably more than 3).” The Division of Chemistry notes that at least three reviews were obtained for all REU site proposals and were used in the decision process leading to either an award or a declination. Because of a database error, reviews from some panelists were not properly displayed in eJacket during the COV. This database error has been corrected, and all reviews are now available in eJacket.

Update 2011

The Division is continuously assessing the new program structure and has further fine-tuned the program descriptions. For example, the name of one of the programs was changed (from “Theory, Models, and Computational Methods” to “Chemical Models, Theory and Computational Methods”). A joint retreat with the CBET division helped us assess potential overlap issues as well as synergies between the two divisions, and in particular the divisions’ catalysis programs.

The Division is in the process of splitting the large CSDM program into two sub-components that will be titled “CSDM A” and “CSDM B”. This choice implies that the two sections are closely interrelated but will require the principal investigator to choose a subarea that is most appropriate to their research (just like many journals have an “A” or “B” etc. designation). This change will go in effect in FY13. The advantages are that the program management of each sub-component will operate independently, thus reducing the number of program directors involved and avoiding the lumping together of proposals that are scientifically far removed from each other.

The Division will start to review the strategic directions document in calendar year 2012. Some new strategic directions have been or are being implemented such as the focus on sustainable chemistry as mandated in the Reauthorization of the America COMPETES Act. One example is the focus of the FY12 CCI Phase I and ICC competitions on sustainable chemistry. The solicitations have been changed accordingly. The community was informed about the new focal area in the Division Newsletter from August 2011.