

Appendix A: Online Surveys

Survey of Principal Investigators and Co-Investigators

OMB# 3145-0215

Pilot only:

Thank you for agreeing to help pilot test this survey. Your feedback will help us improve the survey before we send it to other CCI participants.

Please review the instructions on this page and the next before beginning. On each page of the survey we have included a text box for you to add comments about any questions that are not clear or relevant to you. You only need to fill in these text boxes for any survey items for which you have specific comments. At the end of the survey, we have included a brief set of questions on your overall impressions of the survey's content, clarity, and length.

All respondents:

This survey solicits responses from all lead Principal Investigators and co-Investigators participating in the National Science Foundation's (NSF) Centers for Chemical Innovation (CCI) Program. The goal of the survey is to inform the evaluation of the program. We are asking for information to supplement your annual reports. All data will be aggregated to not reveal individual respondents. The survey should take no more than 20 minutes to complete.

INSTRUCTIONS

- Please use the survey's navigation buttons ("Back" and "Next") to move through the questionnaire.
- You may exit the survey at any time by pressing the "save and continue later" button. When you re-open the survey, you will be able to continue where you left off.
- Once you reach the last question in the survey, you will see a "submit" button. After clicking this button, your survey will be complete and you may close your browser. Once submitted, you will not be able to return to the survey without contacting our team.
- If you have any questions regarding the survey, you can contact us at CCISurvey@abtassoc.com.

[Verification]

1. Is your name: [First Name, Middle Name/Initial, Last Name]?

- Yes, this is correct
- No, my name has changed or is misspelled. My name is: _____
- No, I'm not the person named above → Exit the survey

2. All of the questions in the survey refer to your participation in the following NSF Center for Chemical Innovation (CCI): [CCI name].

Please note that your center may have been funded under a predecessor to the NSF CCI program such as Chemical Bonding Centers (CBC).

- I have participated in this CCI → 3
- I have participated in a different CCI → A
- I have not participated or I am not sure whether I participated in the CCI program → Exit

A. Please select from the list of options.

If you participated in more than one CCI, please select the CCI with which you have been most extensively involved.

[pull-down menu of CCIs]

3. What is your role in this CCI? Select one.

- Principal Investigator (PI)
- Co-Investigator
- Other. Please specify: _____

4. For how many years have you been or were you associated with the CCI program?¹

- This is the first year
- 1 year
- 2 to 4 years
- 5 to 6 years
- 7 or more years

[Project characteristics]

5. On a scale of 1-5, where 1 indicates “not at all” and 5 indicates “very,” to what extent does the research conducted by your CCI have the following characteristics? Enter one response per row.²

	1-5
Addresses important societal problem	
Focuses on major scientific challenge(s) in fundamental chemistry	
Has the potential to radically change our understanding of an important scientific or engineering concepts	
Interdisciplinary	

¹ AAAS STC Faculty survey item 3

² Includes options from Abt INSPIRE survey

	1-5
High-risk	
Requires a coordinated effort from diverse experts	
Requires large investment of funds	

[Pre-existing collaboration and role of CCI in collaboration]

6. Had you collaborated with any or all of the CCI partners before the center was established?

Select one.

- None of the partners → 9
- Some partners → 7
- Half or more of the partners → 7

7. For how many years had you collaborated with any of the CCI partners before the center was established?

Years: _____

8. To what extent has participation in CCI influenced these pre-existing collaborations? Select one.

- Not at all
- To some extent
- To a considerable extent

9. Have you continued or do you expect to continue collaborating with CCI partners? Select all that apply.

- No
- I maintained or expect to maintain some CCI collaborations after the grant ends
- I maintained or expect to maintain most or all CCI collaborations after the grant ends
- Uncertain

[Benefits of CCI participation: research, personal visibility, and infrastructure for the community]

10. Please indicate whether participation in the CCI has benefited your research program. Select one response per row.³

	No benefit due to CCI	Some benefit due to CCI	Large benefit due to CCI	Not applicable
Use of new theoretical models				
Use of new/additional instrumentation or technology				
Use of new/additional data sources				
Use of new/additional theoretical or experimental models				
Ability to generate new and/or better ideas				
Ability to more quickly/effectively respond to scientific developments				
Ability to take your research in a new direction				
Access to resources at partner institutions				
Access to resources at your institution				

³ STC faculty survey item 9 modified

	No benefit due to CCI	Some benefit due to CCI	Large benefit due to CCI	Not applicable
Ability to attract better qualified or more diverse students and postdocs to your research group				
Ability to obtain additional funding to support your research				

11. Have any of the following changes occurred in your publication patterns, research interests, and/or professional visibility since you began participating in CCI? Select one response per row.

	Decreased due to CCI participation	Decreased, but not due to CCI participation	Has not changed	Increased, but not due to CCI participation	Increased due to CCI participation
Number of papers published per year					
Journal quality					
Publishing in a broader range of journals					
Publishing with industry					
Funding from industry					
Interest in commercialization					
Participation in new professional conferences, associations or societies					
Number of speaking invitations					
Requests to serve on dissertation committees outside your home institution					
Requests to serve on advisory panels					
Requests to serve on editorial board of journals					
Requests to serve as a peer reviewer					
Requests to provide policy advice or testimony					
Receipt of awards, fellowships, or chaired positions					
Diversity of research problems on which you work					

12. Which of the following resources/infrastructure created or improved by CCI, if any, are being used by researchers not affiliated with the center? Select all that apply.

- Methods or instruments, research practice
- Reagents

- Data
- Communication infrastructure
- Educational or outreach materials
- Facilities or equipment
- Lessons learned for how to run a large center
- New partnerships or alliances
- Other resources. Please specify: _____

[Benefits of CCI participation: broader impacts]

13. Please indicate whether your CCI developed or improved the following infrastructure to develop workforce, broaden participation of underrepresented groups in chemistry, and improve public outreach, and if you expect to be able to sustain it after the grant ends.

	Developed/ Enhanced	Expect to sustain after CCI grant ends (current grants) or Still in place (grants that ended)
Courses/seminars in chemistry		
Training programs in chemistry		
Research and teaching experiences for students and postdocs		
Programs for educating the public about chemistry		
Mechanisms for recruitment and/or retention of individuals from underrepresented groups [hyperlink defining URGs]		
Mechanisms for mentorship of individuals from underrepresented groups		
Engagement with organizations with expertise supporting underrepresented groups in the scientific community		
Engagement with organizations focused on outreach and advocacy to pre-college, public, or policymaker audiences		

[URGs include women, members of racial and ethnic minorities, persons with disabilities, and persons with low socio-economic status]

14. Please indicate whether the following improvements have occurred as a result of CCI funding. Select one response per row.

	No improvement due to CCI	Some improvement due to CCI	Large improvement due to CCI
Increased participation of underrepresented groups in your lab			
Increased participation of underrepresented groups at your institution			
Improved ability of students and postdocs to obtain a position after leaving CCI			
Improved quality of education in chemistry			

	No improvement due to CCI	Some improvement due to CCI	Large improvement due to CCI
Increased interest in/understanding of chemistry among the public you were able to reach			

15. Please indicate whether the CCI delivered any of the following benefits to industry. Select one response per row.

	No benefit due to CCI	Some benefit due to CCI	Large benefit due to CCI
New or improved ideas for commercial product or process			
New or improved product or process			
Reduction in environmental impact			
Ability to meet regulatory requirements			
Access to personnel			
Increase in sales			
Cost savings			
Other benefits. Please specify: _____			

[Center organization and function]

16. On a scale of 1-5, where 1=least and 5=most, how satisfied are you with the following elements of CCI? To what extent have these elements contributed to the success of your center?

	N/A	Satisfaction: 1-5	Contribution to success: None/Some/Considerable
Requirement to develop a strategic plan			
Distribution of resources among partners			
Sharing of credit among partners			
Policies for conflict resolution			
Intellectual contribution of partners			
Productivity of meetings among partners			
Frequency of meeting among partners			
Communication tools			
Data sharing tools			
Professional development opportunities for students/postdocs			
Broadening participation activities and programs			
Public outreach activities and programs			
Leadership of the center			
Overall direction of the center			
Funding level for Phase I (<i>Display for Phase I only</i>)			
Funding level for Phase II (<i>Display for Phase II only</i>)			

Duration of Phase I (<i>Display for Phase I only</i>)			
Duration of Phase II (<i>Display for Phase II only</i>)			

17. Overall, how would you rate your experience in the CCI? Select one.⁴

- Very satisfied
- Satisfied
- Somewhat satisfied
- Dissatisfied
- Very dissatisfied

18. To what extent has your CCI experienced the following challenges? Have these been resolved?

Challenge	Experienced or not Yes/No	Resolved [only if experienced] No/To some extent/Fully
Technical or experimental challenges		
Meeting administrative requirements		
Sharing of credit for discovery		
Communication between partners		
Coordination of activities between partners		
Contributions by partners to the center		
Delays in progress of research		
Staffing of the center		
Access to needed resources		
Seeding new projects		
Terminating unsuccessful projects		
Other challenge. Please specify:		

19. Phase II only: To what extent participation in Phase I contributed to the success of your Phase II center? Select one.

- Not at all
- To some extent
- To a considerable extent

20. Have any of the following occurred as a result of your participation in Phase I? Would these outcomes be more challenging to achieve under a 1-phase center model?

	Occurred	More challenging under a 1-phase center model?
Developed new ideas		
Advanced research program		
Changed direction of research		
Formed new or cemented old collaborations		

⁴ AAAS STC Faculty survey item 14

Recruited staff		
Obtained additional funding to support this research		
Gained experience of participating in or running a center		
Developed a center culture across the team		
Other benefits. Please describe:		
No benefits of participation in Phase I		

21. Phase I only: Have you been able to continue working on the CCI-funded projects? Select one.

- Yes
- No

22. In your view, which of the following are the advantages of the 2-phase model? Select all that apply.

- It enables selection of better Phase II centers by NSF
- It allows participants to determine whether they like the experience
- It allows selection of the right partners
- It allows the centers to refine their research goals and approach
- It allows the centers to pilot activities and programs
- It allows the centers to develop and test policies and procedures
- No advantages
- Other advantages. Please specify: _____

23. In your view, what are the disadvantages of the 2-phase model? Select all that apply.

- Some strong applicants may be discouraged from applying
- Insufficient resources for Phase I grantees not selected for Phase II to continue their research
- Time burden to submit a Phase II application
- Delay in tackling time-sensitive topics
- Other disadvantages. Please specify: _____
- No disadvantages

24. On balance, is a 2-phase center model preferable to a single phase? Select one.

- Yes, 2-phase model is preferable
- No, 1-phase model is preferable
- Uncertain

Pilot only:

In addition to any feedback that you provided in the comment boxes on each page, please answer the following questions. You may use the survey's navigation buttons ("Back" and "Next") to remind yourself of specific questions. Please be honest and critical in your feedback. The study team will use your feedback to revise and improve the survey before administering it to other CCI participants.

Are the survey items easy to answer?

- Yes
- No → Please explain. _____

Are the survey instructions easy to follow?

- Yes
- No → Please explain. _____

Are the questions in an order that makes logical sense?

- Yes
- No → Please explain. _____

Are the questions clearly worded?

- Yes
- No → Please explain. _____

Does the survey:

- Have too few questions about each topic? → Please explain. _____
- Have the right amount of questions about each topic?
- Have too many questions about each topic? → Please explain. _____

Do you have any other comments about the survey?

- Yes
- No → Please explain. _____

