

APPENDIX D

Survey of Faculty Mentors: Topline Results (2003–2006 Aggregate)

NATIONAL SCIENCE FOUNDATION DIRECTORATE FOR ENGINEERING
NATIONAL INSTITUTE OF BIOMEDICAL IMAGING AND BIOENGINEERING

BIOENGINEERING AND BIOINFORMATICS SUMMER INSTITUTES PROGRAM (BBSI)

SURVEY OF FACULTY MENTORS

All of your responses to this questionnaire are **strictly confidential.**

Submission of the requested information is voluntary. Pursuant to 5 CFR 1320.5(b), an agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0207. Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Suzanne Plimpton, Reports Clearance Officer for OMB Collection #3145-0207, Facilities and Operations Branch, Division of Administrative Services, National Science Foundation, 4201 Wilson Blvd., Suite 295, Arlington, VA 22230.

SECTION A: YOUR PARTICIPATION IN BBSI

A1. How important was each of the following in your decision to participate in the BBSI program?

Decision Factors	Not Important		Somewhat Important		Fairly Important		Extremely Important		Overall Rating
	N	%	N	%	N	%	N	%	Mean
Advancing the field of bioengineering or bioinformatics (<i>TOTAL N: 105</i>)	2	1.9	24	22.9	45	42.9	34	32.4	3.1
Giving back for your own undergraduate/graduate school experiences with mentors (<i>TOTAL N: 105</i>)	9	8.6	22	21.0	43	41.0	31	29.5	2.9
Interacting/collaborating with colleagues in other departments/schools within your institution (<i>TOTAL N: 105</i>)	10	9.5	26	24.8	32	30.5	37	35.2	2.9
Interacting/collaborating with colleagues at your BBSI partner institutions (<i>TOTAL N: 104</i>)	38	36.5	30	28.8	28	26.9	8	7.7	2.1
Having an opportunity you wouldn't have during the school year to work with undergraduate students (<i>TOTAL N: 105</i>)	14	13.3	25	23.8	35	33.3	31	29.5	2.8
Having an opportunity to teach (<i>TOTAL N: 104</i>)	17	16.3	31	29.8	43	41.3	13	12.5	2.5
Giving undergraduate students a hands-on research experience (<i>TOTAL N: 105</i>)	1	1.0	3	2.9	22	21.0	79	75.2	3.7
Working with a diverse group of students (<i>TOTAL N: 104</i>)	3	2.9	18	17.3	36	34.6	47	45.2	3.2
Advancing your career (<i>TOTAL N: 104</i>)	43	41.3	34	32.7	19	18.3	8	7.7	1.9
Bringing recognition to your department/program or institution (<i>TOTAL N: 103</i>)	17	16.5	17	16.5	45	43.7	24	23.3	2.7
Other (<i>please specify</i>) (<i>TOTAL N: 9</i>)	2	22.2	1	11.1	3	33.3	3	33.3	2.8

A2. Were you involved in selecting students to participate in the BBSI program?

	N	%	
Yes.....	49	45.8	
No.....	58	54.2	→ Please continue to Question A5 by clicking HERE
TOTAL N:	107	100.0	

Appendix D (continued)

A3. In your opinion, how important was each of the following in selecting students to participate in the BBSI program?

Selection Criteria	Not Important		Somewhat Important		Fairly Important		Extremely Important		Overall Rating
	N	%	N	%	N	%	N	%	Mean
Overall grade point average (<i>TOTAL N: 48</i>)	1	2.1	14	29.2	21	43.8	12	25.0	2.9
Grade point average in major or selected courses (<i>TOTAL N: 49</i>)	0	0.0	5	10.2	30	61.2	14	28.6	3.2
Academic major (<i>TOTAL N: 48</i>)	0	0.0	12	25.0	27	56.3	9	18.8	2.9
Academic level (rising sophomore/junior/senior, graduate student) (<i>TOTAL N: 48</i>)	5	10.4	16	33.3	22	45.8	5	10.4	2.6
Courses taken (<i>TOTAL N: 48</i>)	1	2.1	14	29.2	24	50.0	9	18.8	2.9
Previous research experience (<i>TOTAL N: 48</i>)	9	18.8	16	33.3	16	33.3	7	14.6	2.4
Previous experience in bioengineering or bioinformatics (<i>TOTAL N: 48</i>)	19	39.6	14	29.2	12	25.0	3	6.3	2.0
Student's essay/statement of interest (<i>TOTAL N: 49</i>)	1	2.0	10	20.4	17	34.7	21	42.9	3.2
Letter(s) of recommendation (<i>TOTAL N: 49</i>)	2	4.1	6	12.2	20	40.8	21	42.9	3.2
Match of student's interests with interests of faculty (<i>TOTAL N: 49</i>)	4	8.2	9	18.4	18	36.7	18	36.7	3.0
Interview or other personal contact with student (<i>TOTAL N: 49</i>)	18	36.7	13	26.5	14	28.6	4	8.2	2.1
Motivation, enthusiasm of student (<i>TOTAL N: 48</i>)	0	0.0	3	6.3	16	33.3	29	60.4	3.5
Obtaining a good mix of majors (<i>TOTAL N: 48</i>)	7	14.6	18	37.5	15	31.3	8	16.7	2.5
Obtaining a good mix of institutions (e.g., research, liberal arts, predominantly minority) (<i>TOTAL N: 49</i>)	12	24.5	14	28.6	18	36.7	5	10.2	2.3
Obtaining a racially/ethnically diverse group (<i>TOTAL N: 49</i>)	3	6.1	10	20.4	20	40.8	16	32.7	3.0
Obtaining a good mix of male and female students (<i>TOTAL N: 49</i>)	3	6.1	6	12.2	25	51.0	15	30.6	3.1
Including students with disabilities (<i>TOTAL N: 49</i>)	9	18.4	13	26.5	21	42.9	6	12.2	2.5
Providing opportunity to students from schools with few undergraduate research opportunities (<i>TOTAL N: 49</i>)	4	8.2	12	24.5	16	32.7	17	34.7	2.9

Appendix D (continued)

A4. In selecting **UNDERGRADUATES for participation in the BBSI program, which of the following did you tend to prefer?** (Include as undergraduates new graduates who had not completed at least one semester of graduate school by the time they entered the BBSI program.)

a. Did you tend to prefer those who were undecided about graduate school OR those who were already committed to going to graduate school?

	N	%
Those who were undecided.....	6	12.2
Those who were committed.....	7	14.3
Some of both.....	23	46.9
Other (please specify).....	1	2.0
No preference.....	12	24.5
TOTAL N:	49	100.0

b. Did you tend to prefer sophomores OR juniors OR seniors OR new graduates?

	N	%
Sophomores	5	10.2
Juniors.....	18	36.7
Seniors	3	6.1
New graduates.....	1	2.0
A mix of classes	14	28.6
No preference.....	8	16.3
TOTAL N:	49	100.0

c. Other important selection criteria: _____

A5. Do you plan to continue, or renew, your participation in the BBSI program?

	N	%
Yes	85	87.6
No	12	12.4
TOTAL N:	97	100.0

SECTION B: YOUR BBSI PROGRAM

NOTE: If you participated in the BBSI program for more than one summer, please answer Questions B1 to B6 for the MOST RECENT SUMMER you participated.

Education Component

B1. Please indicate the educational activities in which students participated during their **first BBSI summer.**

Educational Activities	Yes		No	
	N	%	N	%
Courses/lectures on academic subjects taught by BBSI faculty (<i>TOTAL N: 107</i>)	101	94.4	6	5.6
Research seminars led by BBSI faculty (<i>TOTAL N: 107</i>)	95	88.8	12	11.2
Seminars/lectures given by outside speakers (<i>TOTAL N: 107</i>)	101	94.4	6	5.6
Seminars in which students presented and discussed their research (<i>TOTAL N: 107</i>)	98	91.6	9	8.4
Other (<i>please specify</i>) (<i>TOTAL N: 107</i>)	26	24.3	81	75.7

B2. Please indicate the subjects/topics covered in your BBSI program's courses/seminars/lectures that students attended during their **first BBSI summer.**

Curriculum	Yes		No	
	N	%	N	%
Academic subjects/research topics				
Bioinformatics (<i>TOTAL N: 104</i>)	78	75.0	26	25.0
Bioengineering (<i>TOTAL N: 104</i>)	74	71.2	30	28.8
Other engineering (<i>TOTAL N: 104</i>)	35	33.7	69	66.3
Biology (<i>TOTAL N: 104</i>)	86	82.7	18	17.3
Statistics (<i>TOTAL N: 104</i>)	60	57.7	44	42.3
Computer programming (<i>TOTAL N: 104</i>)	67	64.4	37	35.6
Ethics (<i>TOTAL N: 104</i>)	71	68.3	33	31.7
Research tools and techniques (<i>TOTAL N: 104</i>)	91	87.5	13	12.5
Other (<i>please specify</i>) (<i>TOTAL N: 104</i>)	18	17.3	86	82.7
Professional development topics				
Communication/presentation skills (<i>TOTAL N: 104</i>)	90	86.5	14	13.5
Proposal writing(<i>TOTAL N: 104</i>)	42	40.4	62	59.6
Resume preparation(<i>TOTAL N: 104</i>)	26	25.0	78	75.0
Career planning(<i>TOTAL N: 104</i>)	68	65.4	36	34.6
Other (<i>please specify</i>) (<i>TOTAL N: 104</i>)	6	5.8	98	94.2

Appendix D (continued)

B3. Did you personally teach or lead any courses/seminars/lectures during the most recent summer of your BBSI program?

Educational Activities	Yes		No	
	N	%	N	%
Courses on academic subjects (<i>TOTAL N: 106</i>)	46	43.4	60	56.6
Research seminars (<i>TOTAL N: 106</i>)	49	46.2	57	53.8
Courses/seminars/lectures on professional development (e.g., communication/presentation skills, proposal writing, resume preparation, career planning) (<i>TOTAL N: 106</i>)	16	15.1	90	84.9
Other (<i>please specify</i>) (<i>TOTAL N: 106</i>)	7	6.6	99	93.4
Total responding 'Yes' to one or more of the above (<i>TOTAL N: 106</i>)	76	71.7		
Total responding 'No' to all of the above (<i>TOTAL N: 106</i>)			30	28.3

B4. In your opinion, how important was each of the following educational activities for students during their first BBSI summer?

Educational Activities	Not Important		Somewhat Important		Fairly Important		Extremely Important		Overall Rating
	N	%	N	%	N	%	N	%	Mean
Courses/lectures on academic subjects taught by BBSI faculty (<i>TOTAL N: 104</i>)	4	3.8	13	12.5	46	44.2	41	39.4	3.2
Research seminars led by BBSI faculty (<i>TOTAL N: 104</i>)	5	4.8	18	17.3	55	52.9	26	25.0	3.0
Seminars/lectures given by outside speakers (<i>TOTAL N: 102</i>)	1	1.0	21	20.6	49	48.0	31	30.4	3.1
Seminars in which students presented and discussed their research (<i>TOTAL N: 105</i>)	0	0.0	4	3.8	22	21.0	79	75.2	3.7
Courses/seminars/lectures on professional development (e.g., communication/presentation skills, proposal writing, resume preparation, career planning) (<i>TOTAL N: 104</i>)	5	4.8	23	22.1	44	42.3	32	30.8	3.0

Appendix D (continued)

B5. With respect to the courses/seminars/lectures attended by students during their first BBSI summer, please indicate how much you disagree or agree with each of the following statements.

Statement	Disagree		Disagree Somewhat		Agree Somewhat		Agree		Have No Idea		Overall Rating
	N	%	N	%	N	%	N	%	N	%	Mean
Students gained fundamental knowledge in the subjects relevant to bioengineering and/or bioinformatics. (TOTAL N: 106)	0	0.0	1	0.9	19	17.9	85	80.2	1	0.9	3.8
Students refreshed their previous knowledge of useful tools. (TOTAL N: 106)	4	3.8	7	6.6	36	34.0	42	39.6	17	16.0	3.3
Students learned new tools and skill sets. (TOTAL N: 105)	0	0.0	0	0.0	12	11.4	91	86.7	2	1.9	3.9
Students bonded by spending time together in class. (TOTAL N: 106)	0	0.0	5	4.7	22	20.8	66	62.3	13	12.3	3.7
Students benefited from exposure to career professionals. (TOTAL N: 105)	0	0.0	2	1.9	14	13.3	81	77.1	8	7.6	3.8
Courses/lectures on academic subjects and research seminars are an important feature of the BBSI program. (TOTAL N: 104)	0	0.0	3	2.9	26	25.0	71	68.3	4	3.8	3.7

B6. If you have any comments about the education component of your BBSI program, please enter them here.

Research Component

NOTE: If you participated in the BBSI program for more than one summer, please answer Questions B7 to B9 for the **MOST RECENT SUMMER**.

B7. Please indicate the research-related activities in which students participated during their **first BBSI summer.**

Research-Related Activities	Yes		No	
	N	%	N	%
Writing proposals that described the research they planned to do (<i>TOTAL N: 106</i>)	65	61.3	41	38.7
Collecting and/or analyzing data or information to try to answer research questions (<i>TOTAL N: 106</i>)	102	96.2	4	3.8
Mentoring other students in conducting research or leading student research teams (<i>TOTAL N: 106</i>)	28	26.4	78	73.6
Going on research-related field trip(s) to other labs, universities, industry, etc (<i>TOTAL N: 106</i>)	45	42.5	61	57.5
Preparing/presenting poster presentations that described their research and results (<i>TOTAL N: 106</i>)	83	78.3	23	21.7
Preparing final written research reports that described their research and results (<i>TOTAL N: 106</i>)	81	76.4	25	23.6
Delivering oral presentations that described their research and results (<i>TOTAL N: 106</i>)	101	95.3	5	4.7
Authoring or co-authoring papers/articles that have been or will be submitted for publication in professional journals (<i>TOTAL N: 106</i>)	58	54.7	48	45.3
Attending student conference(s) that included students from multiple colleges (<i>TOTAL N: 106</i>)	41	38.7	65	61.3
Attending professional conference(s) that were not specifically for students (<i>TOTAL N: 106</i>)	28	26.4	78	73.6
Completing their research projects (either during the summer or later) (<i>TOTAL N: 106</i>)	82	77.4	24	22.6
Total responding 'Yes' to one or more of the above	104	98.1		
Total responding 'No' to all of the above			2	1.9

B8. What percentage of their time did students spend on BBSI courses/seminars/lectures vs. "hands-on" research during their **first BBSI summer?**

% Time Spent	Courses/Seminars/Lectures			"Hands-on" Research		
	N	%	<i>m</i>	N	%	<i>m</i>
0% to 20%	26	25.2		1	1.0	
21% to 40%	54	52.4		11	10.7	
41% to 60%	16	15.5		26	25.2	
61% to 80%	7	6.8		60	58.3	
81% to 100%	0	0.0		5	4.9	
<i>Mean Time Spent</i>	<i>103</i>		<i>34.8</i>	<i>103</i>		<i>65.2</i>
TOTAL N:	103	100.0		103	100.0	

Appendix D (continued)

B9. In your opinion, was the amount of time that students spent on BBSI courses/seminars/lectures and “hands-on” research in their first BBSI summer ... ?

Was amount of time ...?	Courses/Seminars/ Lectures		“Hands-on” Research	
	N	%	N	%
Too little.....	0	0.0	23	21.5
About right.....	89	83.2	83	77.6
Too much	13	12.1	0	0.0
Have no idea	5	4.7	1	0.9
<i>TOTAL N:</i>	<i>107</i>	<i>100.0</i>	<i>107</i>	<i>100.0</i>

B10. With respect to students’ experience with “hands-on” research during their first BBSI summer, please indicate how much you disagree or agree with each of the following statements.

Statement	Disagree		Disagree Somewhat		Agree Somewhat		Agree		Have No Idea		Overall Rating
	N	%	N	%	N	%	N	%	N	%	Mean
They learned how to properly design a research project. (<i>TOTAL N: 107</i>)	3	2.8	13	12.1	68	63.6	21	19.6	2	1.9	3.0
They became more skilled at collecting and/or analyzing data or information to answer research questions. (<i>TOTAL N: 107</i>)	1	0.9	2	1.9	38	35.5	64	59.8	2	1.9	3.6
They learned how to present research results. (<i>TOTAL N: 106</i>)	0	0.0	2	1.9	34	32.1	70	66.0	0	0.0	3.6
They learned how to conduct research independently. (<i>TOTAL N: 107</i>)	1	0.9	14	13.1	62	57.9	27	25.2	3	2.8	3.1
They learned how to collaborate with others on research. (<i>TOTAL N: 107</i>)	0	0.0	2	1.9	47	43.9	53	49.5	5	4.7	3.5
“Hands-on” research is an important feature of the BBSI program. (<i>TOTAL N: 107</i>)	0	0.0	1	0.9	3	2.8	99	92.5	4	3.7	4.0

B11. If you have any comments about the research component of your BBSI program, please enter them here.

Second BBSI Summer

NOTE: If you participated in the BBSI program for more than one summer, please answer Questions B12 to B18 for the MOST RECENT SUMMER you participated.

B12. Did any students in your BBSI program participate for two consecutive summers?

	N	%	
Yes	53	49.5	→ Please continue to Question B13
No.....	54	50.5	→ Please continue to Question B19 by clicking HERE
TOTAL N:	107	100.0	

B13. Please indicate the educational activities in which students participated during their **second BBSI summer.**

Educational Activities	Yes		No	
	N	%	N	%
Courses/lectures on academic subjects taught by BBSI faculty (<i>N: 51</i>)	36	70.6	15	29.4
Research seminars led by BBSI faculty (<i>N: 51</i>)	43	84.3	8	15.7
Seminars/lectures given by outside speakers (<i>N: 51</i>)	47	92.2	4	7.8
Seminars in which students presented and discussed their research (<i>N: 51</i>).....	50	98.0	1	2.0
Other (<i>please specify</i>) (<i>N: 51</i>)	4	7.8	47	92.2

B14. What percentage of their time did students spend on BBSI courses/seminars/lectures vs. “hands-on” research during their **second BBSI summer?**

% Time Spent	Courses/Seminars/Lectures			“Hands-on”Research		
	N	%	<i>m</i>	N	%	<i>m</i>
0% to 20%	27	54.0		0	0.0	
21% to 40%	20	40.0		1	2.0	
41% to 60%	3	6.0		8	16.0	
61% to 80%	0	0.0		22	44.0	
81% to 100%	0	0.0		19	38.0	
<i>Mean Time Spent</i>	<i>50</i>		<i>23.8</i>	<i>50</i>		<i>76.2</i>
TOTAL N:	50	100.0		50	100.0	

B15. In your opinion, was the amount of time that students spent on BBSI courses/seminars/lectures and “hands-on” research during their second BBSI summer ... ?

Was amount of time ...?	Courses/Seminars/Lectures		“Hands-on” Research	
	N	%	N	%
Too little.....	0	0.0	4	7.8
About right.....	45	88.2	46	90.2
Too much	5	9.8	0	0.0
Have no idea	1	2.0	1	2.0
TOTAL N:	51	100.0	51	100.0

Appendix D (continued)

B16. With respect to the **second-summer experience, please indicate how much you disagree or agree with each of the following statements.**

Statement	Disagree		Disagree Somewhat		Agree Somewhat		Agree		Have No Idea/Doesn't Apply		Overall Rating
	N	%	N	%	N	%	N	%	N	%	Mean
The second summer allows students to focus a lot more on research than they could in the first summer. (TOTAL N: 51)	0	0.0	2	3.9	13	25.5	35	68.6	1	2.0	3.7
Having had the first-summer experience, students are able to jump right into their research the second summer. (TOTAL N: 51)	0	0.0	1	2.0	16	31.4	33	64.7	1	2.0	3.6
By the end of the second summer, undergraduates resemble graduate students in their ability to do research. (TOTAL N: 51)	1	2.0	3	5.9	23	45.1	23	45.1	1	2.0	3.4
Second-summer students help orient first-summer students and serve as peer mentors. (TOTAL N: 51)	0	0.0	1	2.0	8	15.7	32	62.7	10	19.6	3.8
One summer of BBSI would be enough for most undergraduates. (TOTAL N: 51)	20	39.2	18	35.3	5	9.8	6	11.8	2	3.9	1.9
The coursework for second-summer students should be different in content from that for first-summer students. (TOTAL N: 51)	1	2.0	4	7.8	18	35.3	26	51.0	2	3.9	3.4
The time required for coursework should be less for second-summer students than for first-summer students. (TOTAL N: 51)	1	2.0	3	5.9	17	33.3	28	54.9	2	3.9	3.5
A two-summer program promotes a longer, more continuous connection between faculty and students. (TOTAL N: 51)	0	0.0	1	2.0	9	17.6	40	78.4	1	2.0	3.8
The second summer produces a higher quality student. (TOTAL N: 51)	2	3.9	4	7.8	7	13.7	37	72.5	1	2.0	3.6
The real payoff for the program comes in the second summer. (TOTAL N: 51)	4	7.8	12	23.5	22	43.1	11	21.6	2	3.9	2.8
It is better to maximize the number of student participants by minimizing the number of second-summer students. (TOTAL N: 51)	20	39.2	14	27.5	10	19.6	4	7.8	3	5.9	2.0
It is better to fund students for a second summer using non-BBSI resources (e.g., other grant money). (TOTAL N: 51)	20	39.2	20	39.2	5	9.8	5	9.8	1	2.0	1.9
The second-summer experience is an important feature of the BBSI program. (TOTAL N: 51)	2	3.9	2	3.9	10	19.6	36	70.6	1	2.0	3.6

Appendix D (continued)

B17. In your opinion, which students should be invited back for a second summer?

	N	%
All of them	23	44.2
Only outstanding students	26	50.0
None of them; the second summer should be dropped from the BBSI program	3	5.8
TOTAL N:	52	100.0

Please explain your response: _____

B18. If you have any comments about the second-summer experience of the BBSI program, please enter them here.

Graduate Students

NOTE: If you participated in the BBSI program for more than one summer, please answer Questions B19 to B21 for the MOST RECENT SUMMER you participated.

B19. Were there any graduate student participants in your BBSI program who had to satisfy the same coursework and research requirements as the undergraduate students? (Consider as graduate students only those who had completed at least one semester of graduate school.)

	N	%	
Yes	31	29.0	→ Please continue to Question B20
No.....	46	43.0	→ Please skip to Question B22 by clicking HERE
Have no idea ..	30	28.0	→ Please skip to Question B22 by clicking HERE
TOTAL N:	107	100.0	

B20. With respect to graduate student participants in the BBSI program, please indicate how much you disagree or agree with each of the following statements.

Statement	Disagree		Disagree Somewhat		Agree Somewhat		Agree		Have No Idea		Overall Rating
	N	%	N	%	N	%	N	%	N	%	Mean
Undergraduate students benefit from observing the maturity and work ethic of graduate student participants. (TOTAL N: 31)	0	0.0	3	9.7	12	38.7	13	41.9	3	9.7	3.4
Graduate student participants help undergraduates in considering further education and career tracks. (TOTAL N: 31)	1	3.2	2	6.5	11	35.5	13	41.9	4	12.9	3.3
The BBSI program gives graduate student participants an opportunity to change direction or narrow their focus. (TOTAL N: 30)	1	3.3	6	20.0	8	26.7	12	40.0	3	10.0	3.1
Allowing graduate students to participate is an important feature of the BBSI program. (TOTAL N: 31)	3	9.7	3	9.7	13	41.9	12	38.7	0	0.0	3.1

B21. If you have any comments about the participation of graduate students in the BBSI program, please enter them here.

Student Mentoring

NOTE: If you participated in the BBSI program for more than one summer, please consider ALL of your BBSI summers when answering Questions B22 to B30.

B22. Which of the following best describes the focus of your BBSI research?

	N	%	
Bioengineering or biomedical engineering ...	40	37.7	→ Please specify subfield (if any) in the box below
Bioinformatics.....	49	46.2	→ Please specify subfield (if any) in the box below
Both fields.....	8	7.5	→ Please specify subfield (if any) in the box below
Other field(s) (<i>please specify</i>)	9	8.5	→ Please specify field(s) in the box below
TOTAL N:	106	100.0	

B23. Considering ALL the summers you participated in the BBSI program, how many BBSI students did you personally mentor?

If None, enter 00 and skip to Section C by clicking [HERE](#)

Number of students	N	%	<i>m</i>
None	2	1.9	
1 or 2	35	33.7	
3 or 4	33	31.7	
5 or more	34	32.7	
<i>Mean number of students per mentor.....</i>	<i>104</i>		<i>5.0</i>
TOTAL N:	104	100.0	

B24. On average, how many hours per student per week did you engage in research-related mentoring activities?

Number of hours spent with each student per week	N	%	<i>m</i>
1 to 4 hours.....	38	36.9	
5 hours.....	27	26.2	
6 or more hours	38	36.9	
<i>Mean number of hours spent.....</i>	<i>103</i>		<i>8.2</i>
TOTAL N:	103	100.0	

Appendix D (continued)

B25. Please indicate the ways in which you helped the students you mentored, during their BBSI summers (Column A) and also after they completed the BBSI program (Column B).

During BBSI Summer (Column A)	Yes		No		Doesn't Apply	
	N	%	N	%	N	%
Advised them on the direction of their research (TOTAL N: 103)	102	99.0	1	1.0	0	0.0
Advised them on courses to take in undergraduate school (TOTAL N: 103)	33	32.0	60	58.3	10	9.7
Advised them on graduate school plans (TOTAL N: 102)	85	83.3	13	12.7	4	3.9
Advised them on career choices (TOTAL N: 103)	74	71.8	23	22.3	6	5.8
Wrote recommendation letter(s) for employment (TOTAL N: 99)	20	20.2	66	66.7	13	13.1
Wrote recommendation letter(s) for graduate school applications (TOTAL N: 99)	45	45.5	48	48.5	6	6.1
Wrote recommendation letter(s) for fellowship/grant/etc. applications (TOTAL N: 98)	30	30.6	62	63.3	6	6.1
Other (please specify) (TOTAL N: 6)	1	16.7	2	33.3	3	50.0

After BBSI Program (Column B)	Yes		No		Doesn't Apply	
	N	%	N	%	N	%
Advised them on the direction of their research (TOTAL N: 91)	38	41.8	40	44.0	13	14.3
Advised them on courses to take in undergraduate school (TOTAL N: 91)	16	17.6	57	62.6	18	19.8
Advised them on graduate school plans (TOTAL N: 92)	52	56.5	29	31.5	11	12.0
Advised them on career choices (TOTAL N: 90).....	43	47.8	33	36.7	14	15.6
Wrote recommendation letter(s) for employment (TOTAL N: 94)	36	38.3	43	45.7	15	16.0
Wrote recommendation letter(s) for graduate school applications (TOTAL N: 97)	76	78.4	12	12.4	9	9.3
Wrote recommendation letter(s) for fellowship/grant/etc. applications (TOTAL N: 94)	50	53.2	33	35.1	11	11.7
Other (please specify) (TOTAL N: 11)	3	27.3	3	27.3	5	45.5

B26. Did you communicate with any of your BBSI students' home institution mentors?

	N	%	
Yes.....	34	32.4	Please continue to Question B27
No.....	71	67.6	→ Please skip to Question B28 by clicking HERE
TOTAL N:	105	100.0	

Appendix D (continued)

B27. When you communicated with your BBSI students' home institution mentors, did you discuss ...?

Mark all that apply

Did you discuss ...?	Yes		No	
	N	%	N	%
The student (<i>TOTAL N: 34</i>).....	33	97.1	1	2.9
Mutual research interests of the mentor and yourself (<i>TOTAL N: 34</i>).....	15	44.1	19	55.9
Collaborations between the mentor and yourself (<i>TOTAL N:34</i>)	14	41.2	20	58.8
Other (<i>please specify</i>) (<i>TOTAL N: 34</i>).....	2	5.9	32	94.1

B28. On average, including both formal and informal activities, how frequently did you socialize with the BBSI students you mentored?

Mentor socialized with students ...	N	%
Not at all.....	34	34.3
Once a month	24	24.2
2-3 times a month.....	7	7.1
4-5 times a month.....	24	24.2
6 or more times a month.....	10	10.1
<i>TOTAL N:</i>	99	100.0

B29. Did you stay in touch with any of the BBSI students that you mentored after they completed the BBSI program?

	N	%
Yes.....	83	83.0
No.....	17	17.0
<i>TOTAL N:</i>	100	100.0

B30. If you have any comments about mentoring BBSI students, please enter them here.

SECTION C: EFFECTS OF THE BBSI PROGRAM

NOTE: If you participated in the BBSI program for more than one summer, please consider **ALL** of your BBSI summers when answering the questions in Section C.

Effects on Students

C1. To what extent do you think the BBSI experience increased each of the following for the students you mentored?

To what extent did the BBSI experience increase...	Not At All		Some-what		A Fair Amount		A Great Deal		Have No Idea		Overall Rating
	N	%	N	%	N	%	N	%	N	%	Mean
Your students' understanding or awareness of...											
what bioengineering and/or bioinformatics are, including the variety of applications (TOTAL N: 106)	0	0.0	2	1.9	37	34.9	65	61.3	2	1.9	3.6
how their work contributed to the "bigger picture" of research in bioengineering and/or bioinformatics (TOTAL N: 104)	0	0.0	9	8.7	40	38.5	51	49.0	4	3.8	3.4
the variety of fields related to bioengineering and/or bioinformatics that they could specialize in (TOTAL N: 103)	1	1.0	3	2.9	37	35.9	60	58.3	2	1.9	3.5
career options in bioengineering and/or bioinformatics (TOTAL N: 105)	1	1.0	9	8.6	42	40.0	51	48.6	2	1.9	3.4
Your students' skills/abilities in...											
working collaboratively with others (TOTAL N: 106)	0	0.0	10	9.4	44	41.5	50	47.2	2	1.9	3.4
working independently (TOTAL N: 106)	1	0.9	10	9.4	40	37.7	54	50.9	1	0.9	3.4
preparing written research reports, papers, or posters (TOTAL N: 105)	0	0.0	9	8.6	43	41.0	52	49.5	1	1.0	3.4
delivering oral/PowerPoint research presentations (TOTAL N: 106)	0	0.0	8	7.5	37	34.9	60	56.6	1	0.9	3.5
Your students'...											
confidence in their research skills generally (TOTAL N: 106)	0	0.0	9	8.5	40	37.7	55	51.9	2	1.9	3.4
qualifications for jobs in bioengineering and/or bioinformatics (TOTAL N: 106)	0	0.0	16	15.1	47	44.3	38	35.8	5	4.7	3.2
understanding of the nature of the job of a researcher (TOTAL N: 105)	0	0.0	5	4.8	38	36.2	61	58.1	1	1.0	3.5
ability to clarify their interests and to make informed decisions about their future plans (TOTAL N: 106)	0	0.0	11	10.4	46	43.4	45	42.5	4	3.8	3.3
confidence in their ability to succeed in graduate school (TOTAL N: 105)	0	0.0	11	10.5	39	37.1	50	47.6	5	4.8	3.4
understanding of what graduate school is like (TOTAL N: 105)	1	1.0	5	4.8	36	34.3	56	53.3	7	6.7	3.5
intellectual and social network of professional colleagues and friends (TOTAL N: 105)	0	0.0	15	14.3	40	38.1	44	41.9	6	5.7	3.3

Appendix D (continued)

C2. At any point in time (during or after the BBSI experience), did you co-author with BBSI students you mentored any peer-reviewed articles about bioengineering or bioinformatics that were, or will be, published in academic journals?

	N	%
Yes.....	49	45.8
No.....	58	54.2
TOTAL N:	107	100.0

Number of articles co-authored with students	N	%
1 article.....	35	72.9
2 or more articles.....	13	27.1
TOTAL N:	48	100.0

C3. If you have any additional comments about the effects (both positive and negative) that the BBSI program has had on students (including those you did not mentor), please enter them here.

C4. How do you think NSF could improve the BBSI experience for students?

Effects on You Personally

C5. With respect to effects on you personally, to what extent has the BBSI program ... ?

To what extent has the BBSI program...?	Not At All		Some-what		A Fair Amount		A Great Deal		Have No Idea		Overall Rating
	N	%	N	%	N	%	N	%	N	%	Mean
Redirected your research (<i>TOTAL N: 106</i>)	59	55.7	41	38.7	4	3.8	1	0.9	1	0.9	1.5
Increased your involvement in interdisciplinary research (<i>TOTAL N: 106</i>)	36	34.0	45	42.5	19	17.9	5	4.7	1	0.9	1.9
Increased your interactions with faculty in other departments/schools within your institution (<i>TOTAL N: 106</i>)	24	22.6	34	32.1	31	29.2	17	16.0	0	0.0	2.4
Increased your interactions with faculty at other institutions (<i>TOTAL N: 105</i>)	48	45.7	39	37.1	12	11.4	6	5.7	0	0.0	1.8
Led to new collaborations with faculty in other departments/schools within your institution (<i>TOTAL N: 106</i>)	46	43.4	31	29.2	18	17.0	10	9.4	1	0.9	1.9
Led to new collaborations with faculty at other institutions (<i>TOTAL N: 106</i>)	76	71.7	24	22.6	2	1.9	3	2.8	1	0.9	1.4
Provided an opportunity you didn't have during the school year to work with undergraduate students (<i>TOTAL N: 106</i>)	22	20.8	27	25.5	22	20.8	34	32.1	1	0.9	2.6
Allowed you to gain needed teaching experience (<i>TOTAL N: 106</i>)	47	44.3	43	40.6	11	10.4	4	3.8	1	0.9	1.7
Brought greater visibility to your academic activities (<i>TOTAL N: 106</i>)	32	30.2	44	41.5	19	17.9	9	8.5	2	1.9	2.0
Helped you get a promotion in academic rank (<i>TOTAL N: 105</i>)	74	70.5	17	16.2	3	2.9	4	3.8	7	6.7	1.4
Helped you in the tenure process (<i>TOTAL N: 106</i>)	76	71.7	15	14.2	2	1.9	3	2.8	10	9.4	1.3
Slowed you down in the tenure process (<i>TOTAL N: 106</i>)	90	84.9	5	4.7	3	2.8	0	0.0	8	7.5	1.1
Led to publication of your article(s) in peer-reviewed journals (<i>TOTAL N: 106</i>)	47	44.3	34	32.1	16	15.1	6	5.7	3	2.8	1.8
Reduced your usual publication output (<i>TOTAL N: 106</i>)	80	75.5	18	17.0	2	1.9	1	0.9	5	4.7	1.2
Limited your time for doing research (<i>TOTAL N: 106</i>)	59	55.7	38	35.8	5	4.7	2	1.9	2	1.9	1.5
Left you with little time to spend with family and friends (<i>TOTAL N: 106</i>)	77	72.6	21	19.8	4	3.8	1	0.9	3	2.8	1.3
Other (<i>please specify</i>) (<i>TOTAL N: 5</i>)	2	40.0	0	0.0	0	0.0	1	20.0	2	40.0	2.0

Appendix D (continued)

C6. If you have any additional comments about the effects (both positive and negative) that your BBSI program has had on you personally, please enter them here.

C7. How do you think NSF could improve the BBSI experience for faculty mentors?

Effects on Your Institution, Department, or Program

C8. With respect to effects on your BBSI institution, department, or program, to what extent has the BBSI program ... ?

To what extent has the BBSI program...?	Not At All		Some-what		A Fair Amount		A Great Deal		Have No Idea		Overall Rating
	N	%	N	%	N	%	N	%	N	%	Mean
Increased interactions/collaborations among faculty in different departments or on different campuses of your institution (TOTAL N: 104)	8	7.7	39	37.5	35	33.7	14	13.5	8	7.7	2.6
Increased interactions/collaborations with other institutions (TOTAL N: 105)	24	22.9	44	41.9	15	14.3	6	5.7	16	15.2	2.0
Helped in recruiting high quality students (TOTAL N: 104)	9	8.7	32	30.8	36	34.6	15	14.4	12	11.5	2.6
Led to the creation of a new graduate program in bio/biomedical engineering, bioinformatics, or related field (TOTAL N: 103)	52	50.5	18	17.5	11	10.7	8	7.8	14	13.6	1.7
Brought new recognition/prestige to your institution, department, or program (TOTAL N: 105)	9	8.6	28	26.7	45	42.9	11	10.5	12	11.4	2.6
Changed perceptions about what undergraduates can do (TOTAL N: 105)	16	15.2	44	41.9	26	24.8	10	9.5	9	8.6	2.3
Promoted interdisciplinary research (TOTAL N: 105)	9	8.6	32	30.5	40	38.1	19	18.1	5	4.8	2.7
Other (please specify) (TOTAL N: 5)	1	20.0	0	0.0	1	20.0	1	20.0	2	40.0	2.7

C9. If you have any additional comments about the effects (both positive and negative) that your BBSI program has had on your institution, department, or program, please enter them here.

C10. How do you think NSF could improve the BBSI program for institutions?**C11. Which of the following best describes your department's position on undergraduate research mentoring/supervising?**

	N	%
Faculty are required to mentor/supervise undergraduate research	11	10.6
Faculty are not required to mentor/supervise undergraduate research, but are encouraged to do so ...	65	62.5
The department takes no position on mentoring/supervising undergraduate research.....	25	24.0
Other (<i>please specify</i>)	3	2.9
TOTAL N:	104	100.0

SECTION D: CURRENT EMPLOYMENT**D1. Which field(s) best describe the work you do in your current job(s)?**

	N	%	
Bioengineering or biomedical engineering ...	38	35.5	→ Please specify subfield (if any) in the box below
Bioinformatics.....	42	39.3	→ Please specify subfield (if any) in the box below
Both fields.....	4	3.7	→ Please specify subfield (if any) in the box below
Other field(s) (<i>please specify</i>)	23	21.5	→ Please specify field(s) in the box below
TOTAL N:	107	100.0	

D2. By which of the following kinds of organizations are you currently employed?*Mark all that apply*

	N	%
College/university	101	94.4
Industry/for-profit organization..	0	0.0
Non-profit organization.....	9	8.4
Government.....	3	2.8
Other (<i>please specify</i>)	0	0.0
TOTAL N:	107	100.0

Note: Categories sum to more than 107 (N) and more than 100% because multiple responses were allowed.

Appendix D (continued)

IF YOU ARE NOT CURRENTLY EMPLOYED BY A COLLEGE/UNIVERSITY, PLEASE SKIP TO SECTION E BY CLICKING [HERE](#).

D3. (If currently employed by a college/university) What is your current academic rank?

	N	%
Professor	35	35.7
Associate professor	32	32.7
Assistant professor	22	22.4
Adjunct professor.....	0	0.0
Instructor or lecturer.....	0	0.0
Research associate	4	4.1
Other (<i>please specify</i>)	5	5.1
TOTAL N:	98	100.0

D4. (If currently employed by a college/university) What is your current tenure status?

	N	%
Doesn't apply: No tenure system here	4	4.1
Tenured	56	57.1
On tenure track but not tenured	26	26.5
Not on tenure track.....	12	12.2
TOTAL N:	98	100.0

SECTION E: BACKGROUND INFORMATION

NOTE: The following information will help us interpret your responses to the previous questions. ALL of your responses to this questionnaire are strictly confidential and will not be released to anyone outside of our small research project team.

E1. What is your age?

	N	%	<i>m</i>
Under 40	25	24.5	
40 to 45	24	23.5	
46 to 50	15	14.7	
Over 50	38	37.3	
<i>Mean age</i>	102		46.6
TOTAL N:	102	100.0	

E2. What is your sex?

	N	%
Male	84	78.5
Female.....	23	21.5
TOTAL N:	107	100.0

E3. What is your citizenship status?

	N	%
US citizen since birth.....	67	63.8
US naturalized citizen.....	15	14.3
Non-US citizen with a permanent US resident visa (“Green Card”).....	18	17.1
Non-US citizen with a temporary US visa	5	4.8
TOTAL N:	105	100.0

E4. Are you Hispanic or Latino?

	N	%
Yes	6	5.9
No	95	94.1
TOTAL N:	101	100.0

E5. What is your racial background?

	N	%
American Indian or Alaskan Native.....	0	0.0
Native Hawaiian or Pacific Islander	0	0.0
Asian	15	15.2
Black or African American.....	0	0.0
White	84	84.8
TOTAL N:	99	100.0

E5. If you have any comments about this survey, please enter them here.

THANK YOU VERY MUCH FOR YOUR PARTICIPATION IN THIS STUDY

APPENDIX E

Survey of Non-Awardees: Topline Results (2002 Competition)

NATIONAL SCIENCE FOUNDATION DIRECTORATE FOR ENGINEERING
NATIONAL INSTITUTE OF BIOMEDICAL IMAGING AND BIOENGINEERING

BIOENGINEERING AND BIOINFORMATICS SUMMER INSTITUTES PROGRAM (BBSI)

SURVEY OF NON-AWARDEES

All of your responses to this questionnaire are **strictly confidential**.

Submission of the requested information is voluntary. Pursuant to 5 CFR 1320.5(b), an agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0207. Public reporting burden for this collection of information is estimated to average 15 minutes per response, including the time for reviewing instructions. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Suzanne Plimpton, Reports Clearance Officer for OMB Collection 3145-0207, Facilities and Operations Branch, Division of Administrative Services, National Science Foundation, 4201 Wilson Blvd., Suite 295, Arlington, VA 22230.

SECTION A: FOLLOW-UP TO YOUR BBSI GRANT APPLICATION

- A1. When you did not receive a BBSI grant, did you apply for new funding that would give undergraduates a research experience in bioengineering or bioinformatics?**

Mark all that apply

Applied for new funding?	Yes		No	
	N	%	N	%
Reapplied for BBSI funding (<i>TOTAL N: 14</i>)	2	14.3	12	85.7
Applied for new Research Experiences for Undergraduates (REU) funding from NSF or NIH (<i>TOTAL N: 14</i>)	1	7.1	13	92.9
Applied for undergraduate research funding from agencies other than NSF and NIH (<i>TOTAL N: 14</i>)	1	7.1	13	92.9
Other (<i>please specify (TOTAL N: 14)</i>)	3	21.4	11	78.6
Total responding 'Yes' to one or more of the above	6	42.9		
Total responding 'No' to all of the above			8	57.1

IF YOU ANSWERED "YES" IN **ANY** ROW, PLEASE CONTINUE TO QUESTION A2

IF YOU ANSWERED "NO" IN **ALL** ROWS, PLEASE SKIP TO QUESTION A4 BY CLICKING [HERE](#)

- A2. (If you applied for other funding that would give undergraduates a research experience in bioengineering or bioinformatics) Did you receive any awards?**

	N	%	
Yes	1	16.7	→ Please describe and the skip to Question A4 by clicking HERE
No.....	5	83.3	→ Please continue
TOTAL N: ...	6	100.0	

- A3. (If you did **not** receive any of the funding you applied for to give undergraduates a research experience in bioengineering or bioinformatics) Do you plan to ...?**

	N	%
Seek new funding for this purpose.....	2	66.7
Drop the idea altogether.....	0	0.0
Don't know	1	33.3
TOTAL N:	3	100.0

A4. Have you engaged in any activity that contributes to undergraduate research experiences in bioengineering or bioinformatics?

	N	%	
Yes	11	84.6	→ Please describe _____
No.....	2	15.4	→
TOTAL N: ...	13	100.0	

SECTION B: CURRENT EMPLOYMENT

NOTE: The following information will help us interpret your responses to the previous questions. **ALL** of your responses to this questionnaire are strictly confidential and will not be released to anyone outside of our small research project team.

B1. Which field(s) best describe the work you do in your current job(s)?

	N	%	
Bioengineering or biomedical engineering ...	5	35.7	→ Please specify subfield (if any) in the box below
Bioinformatics.....	7	50.0	→ Please specify subfield (if any) in the box below
Both fields.....	1	7.1	→ Please specify subfield (if any) in the box below
Other field(s) (<i>please specify</i>)	1	7.1	→ Please specify field(s) in the box below
TOTAL N:	14	100.0	

B2. By which of the following kinds of organizations are you currently employed?

Mark all that apply

	N	%
College/university	14	100.0
Industry/for-profit organization.....	0	0.0
Non-profit organization.....	1	7.1
Government.....	1	7.1
Other (<i>please specify</i>)	0	0.0
TOTAL N:	14	100.0

Note: Categories sum to more than 14 (N) and more than 100% because multiple responses were allowed.

IF YOU ARE NOT CURRENTLY EMPLOYED BY A COLLEGE/UNIVERSITY, PLEASE SKIP TO SECTION C BY CLICKING [HERE](#)

Appendix E (continued)

B3. (If currently employed by a college/university) What is your current academic rank?

	N	%
Professor	6	46.2
Associate professor	5	38.5
Assistant professor	0	0.0
Adjunct professor.....	0	0.0
Instructor or lecturer.....	0	0.0
Research associate	1	7.7
Other (<i>please specify</i>)	1	7.7
TOTAL N:	13	100.0

B4. (If currently employed by a college/university) What is your current tenure status?

	N	%
Doesn't apply: No tenure system here	0	0.0
Tenured	10	76.9
On tenure track but not tenured	0	0.0
Not on tenure track.....	3	23.1
TOTAL N:	13	100.0

B5. (If currently employed by a college/university) Which of the following best describes your department's position on undergraduate research mentoring/supervising?

	N	%
Faculty are required mentor/supervise undergraduate research	3	23.1
Faculty are not required to mentor/supervise undergraduate research, but are encouraged to do so	4	30.8
The department takes no position on mentoring/supervising undergraduate research	6	46.2
Other (<i>please specify</i>)	0	0.0
TOTAL N:	13	100.0

SECTION C: BACKGROUND INFORMATION

NOTE: The following information will help us interpret your responses to the previous questions. **ALL** of your responses to this questionnaire are strictly confidential and will not be released to anyone outside of our small research project team.

C1. What is your age?

	N	%	<i>m</i>
Under 40	1	7.1	
40 to 45	1	7.1	
46 to 50	2	14.3	
Over 50	10	71.4	
<i>Mean age</i>	<i>14</i>		<i>53.8</i>
TOTAL N:	14	100.0	

C2. What is your sex?

	N	%
Male	12	85.7
Female.....	2	14.3
TOTAL N:	14	100.0

C3. What is your citizenship status?

	N	%
US citizen since birth	10	71.4
US naturalized citizen	4	28.6
Non-US citizen with a permanent US resident visa ("Green Card")....	0	0.0
Non-US citizen with a temporary US visa	0	0.0
TOTAL N:	14	100.0

C4. Are you Hispanic or Latino?

	N	%
Yes	0	0.0
No	13	100.0
TOTAL N:	13	100.0

Appendix E (continued)

C5. What is your racial background?

Mark all that apply

	N	%
American Indian or Alaskan Native.....	0	0.0
Native Hawaiian or Pacific Islander	0	0.0
Asian	3	21.4
Black or African American.....	0	0.0
White	11	78.6
TOTAL N:	14	100.0

SECTION D: OVERVIEW

D1. How do you think NSF could improve the BBSI proposal process?

D2. How do you think NSF could improve research experiences for undergraduate students?

D3. If you have any other comments, including comments about this survey, please enter them here.

THANK YOU VERY MUCH FOR YOUR PARTICIPATION IN THIS STUDY