



# Evaluation Report

## Undergraduate Research Conference at the Interface Between Biology and Mathematics

October 23-24, 2009

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## Executive Summary

### Brief Synopsis of Event

This report is an evaluation of NIMBioS' first annual Undergraduate Research Conference at the Interface Between Biology and Mathematics, which took place at University of Tennessee's Conference Center in downtown Knoxville October 23-24, 2009. The event was organized by NIMBioS' Education and Outreach Associate Director for Education, Outreach, and Diversity, Suzanne Lenhart, and Sarah Duncan, Education and Outreach Coordinator.

The conference comprised nearly 200 participants, including college/university undergraduates, college/university faculty and staff, government employees, graduate students, and postdoctoral researchers. Undergraduates in biology, mathematics, computer science and related fields gave talks and presented posters on topics ranging from modeling diseases to using mathematics to understand population dynamics and biological phenomena. The conference featured 40 student talks and 40 student posters.

Keynote speakers at the conference included Lisa J. Fauci, professor of mathematics at Tulane University, who discussed the dynamics of cilia and flagella, and Paul E. Super, science coordinator at the Great Smoky Mountains National Park (GSMNP), who talked about research, inventories, and monitoring used in protection efforts at GSMNP. The conference also included a panel discussion with university faculty on career opportunities at the interface of mathematics and biology.

### Evaluation Design

An electronic survey aligned to the following evaluation questions was designed by NIMBioS' Evaluation Coordinator with input from the NIMBioS Associate Director for Education, Outreach, and Diversity, and NIMBioS' Education and Outreach Coordinator:

1. Were participants satisfied with the conference overall?
2. Did the conference meet participant expectations?
3. Do participants feel the conference allowed them to make new connections with others in math and biology?
4. Do participants feel they gained a better understanding of undergraduate research happening in mathematical biology?
5. What impact do undergraduate participants feel the conference will have on their future career plans?
6. Were participants satisfied with the accommodations offered by NIMBioS?
7. What changes in accommodations, group format, and/or content would participants like to see at future similar meetings?

The final instrument was hosted online via the University of Tennessee's secure online survey host mrlInterview. Links to the survey were sent to 175 conference participants (four participants who were

affiliated with NIMBioS were excluded from the evaluation) on October 26, 2009. Reminder emails were sent to non-responding participants on November 2 and 5, 2009. By November 12, 2009, 142 participants (77 of whom were undergraduates) had given their feedback, for a response rate of 81%.

An electronic demographics survey aligned to the reporting requirements of the National Science Foundation was designed by NIMBioS' Evaluation Coordinator with input from NIMBioS' Director. The final instrument was hosted online via the University of Tennessee's online survey host mrInterview. Links to the survey were sent to the 173 conference participants who had not previously attended a NIMBioS event on October 14, 2009. Reminder emails were sent to non-responding participants on October 19 and 22, 2009. By October 25, 2009, 121 participants had filled out the survey for a response rate of 70%. Demographics questions regarding gender, race, and ethnicity, and disability status were optional (disability status is not reported in this evaluation report). All demographics information is confidential, and results are reported only in the aggregate. When feasible, the evaluator filled in missing demographic data from other sources (e.g. address, institution, field of study). The evaluator did not assume race, ethnicity, or disability status for any participant who did not report this information.

## Highlights of Results

- Overall satisfaction with the conference was high among respondents, the majority of whom indicated they either agreed or strongly agreed that the conference was productive (86%) and met their expectations (88%).
- Most respondents thought the presentations were useful (87%), while a smaller majority felt the panel discussions were useful (73%).
- 91% of respondents either agreed or strongly agreed that they would recommend participating in NIMBioS conferences to their colleagues.
- Overall, respondents reported being satisfied with the conference accommodations provided by NIMBioS.
- Respondents reported relatively high levels of learning about how to present scientific research. Learning gains, however, were slightly lower regarding career opportunities at the interface of mathematics and biology.
- Most respondents felt the most useful aspect of the conference was the student presentations, followed by the good atmosphere for student interaction and the career panel.
- Ninety-five percent of undergraduate respondents said they felt that participating in the conference helped them become more knowledgeable about undergraduate research going on at the interface of biology and math.
- Ninety-two percent of respondents felt the conference format was effective.
- The majority of respondents (97%) agreed that the conference made adequate progress toward its goal of creating a forum through which undergraduates could present research and make new connections at the interface of math and biology.
- Eighty-one percent of undergraduate respondents said they felt that the exchange of ideas that took place during the conference would (or potentially would) influence their career plans.
- The majority of respondents (86%) said they felt that participating in the conference helped them make connections with others within the interdisciplinary field of math and biology.

## Conclusions and Recommendations

Overall, participants felt the conference was successful. Survey respondents were satisfied with the overall event, indicating that it was a productive experience that met their expectations. Respondents were also satisfied with the conference accommodations.

The conference represented a diverse group of participants regarding gender, race, geographic dispersion, and primary field of study; however, little diversity existed in the reported ethnic composition of the group. While only 3% of respondents reported being of Hispanic/Latino ethnicity, it should be noted that this number may not fully reflect the number of participants in this demographic as 30% of participants chose not to provide NIMBioS with this optional information.

Almost all undergraduate respondents said they felt that participating in the conference helped them become more knowledgeable about undergraduate research going on at the interface of biology and math. Respondents also reported relatively high levels of learning about how to present scientific research. Learning gains, however, were slightly lower regarding career opportunities at the interface of mathematics and biology. Of the respondents who felt “neutral” or “disagreed” that they learned anything about career opportunities, the most common complaint was that the career panel contained too little diversity with regard to types of careers represented.

The majority of respondents agreed that the conference made adequate progress toward its goal of creating a forum through which undergraduates can present research and make new connections at the interface of math and biology. While most respondents felt the conference allowed students to make new connections, some suggested adding social functions to the program to facilitate student interactions with each other and participating faculty.

The majority of conference participants said they felt that participating in the conference helped them make connections with others within the interdisciplinary field of math and biology. Many respondents said the conference was a great venue for networking with others with similar interests. In addition to making new connections in the field, a majority of undergraduate respondents said they felt that the exchange of ideas that took place during the conference would (or potentially would) influence their career plans. As a result of their experiences during the conference, several undergraduates decided to pursue a career in the area of mathematical biology, while others indicated they felt the conference gave them more information about careers in the field that would potentially influence their career choices in the future.

Respondents made several suggestions for improving future conferences. Several themes emerged from analysis of these suggestions, including a more diverse career panel, having planned social events, and changes to the poster session. Many respondents indicated that the poster presentation session was the most useful aspect of the conference, and thus requested that this part of the conference be expanded in the future. Other suggestions included having more vegetarian food options, shortening the conference to just one day, and organizing presentations by discipline area.

Based on analysis of participant response data, the recommendations for future conferences are as follows:

- Overall, participants were satisfied with the conference accommodations. No recommendations are necessary here. For miscellaneous participant suggestions, see Appendix C.
- The inclusion of a career panel was very helpful to many undergraduate participants. For future panels, consider adding members from business/industry, as well as people from a wider range of disciplines within academia.
- Regarding the career panel also, consider also having more of a balanced emphasis between choosing graduate school and going directly into the workforce after completing one's undergraduate career as many participants expressed interest in learning more about careers available to those with only undergraduate degrees.
- Consider scheduling social activities into the agenda for the next conference if possible. Several activities were requested by participants including:
  - A mixer for undergraduates only
  - A reception for faculty/PIs only
  - An event designed for undergraduates to get to know faculty/PIs from other institutions
- Look into expanding the poster session for future conferences, as this was a highlight for many participants. Consider scheduling the session earlier in the day, however, if possible.
- Consider having a poster and/or presentation competition with an awards ceremony at the conclusion of the conference.
- If possible, consider having the PI meeting earlier in the conference to enable PIs to better develop relationships during the meeting, and interfere less with student presentations.



# UBM Conference Evaluation Report

## Background

### Introduction

This report is an evaluation of NIMBioS' inaugural Undergraduate Research Conference at the Interface Between Biology and Mathematics, which took place at University of Tennessee's Conference Center in downtown Knoxville October 23-24, 2009. The event was organized by NIMBioS' Education and Outreach Associate Director for Education, Outreach, and Diversity, Suzanne Lenhart, and Sarah Duncan, Education and Outreach Coordinator

The conference comprised nearly 200 participants, including college/university undergraduates, college/university faculty and staff, government employees, graduate students, and postdoctoral researchers. Undergraduates in biology, mathematics, computer science and related fields gave talks and presented posters on topics ranging from modeling diseases to using mathematics to understand population dynamics and biological phenomena. The conference featured 40 student talks and 40 student posters.

Keynote speakers at the conference included Lisa J. Fauci, professor of mathematics at Tulane University, who discussed the dynamics of cilia and flagella, and Paul E. Super, science coordinator at the Great Smoky Mountains National Park (GSMNP), who talked about research, inventories, and monitoring used in protection efforts at GSMNP. The conference also included a panel discussion with university faculty on career opportunities at the interface of mathematics and biology.

### Participant Demographics

The majority of conference participants were college/university faculty/staff, and undergraduate students; however, several participants held other positions (Figure 1). Primary fields of study for the majority of participants included agricultural sciences/natural resources, biological/biomedical sciences, and mathematics, although other disciplines were represented (Table 1).

Figure 1. Status of conference participants

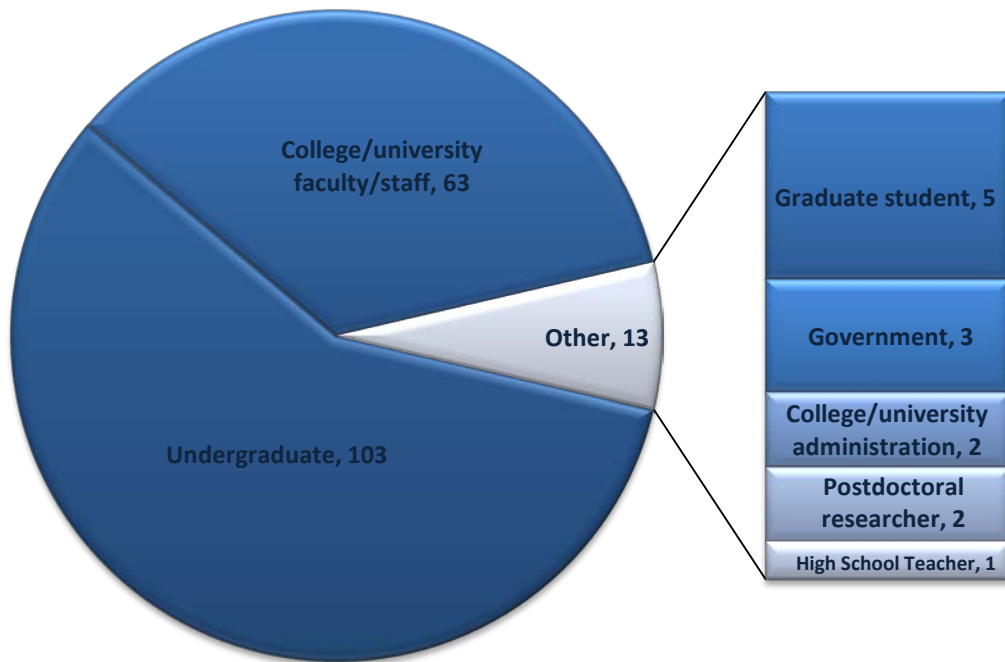
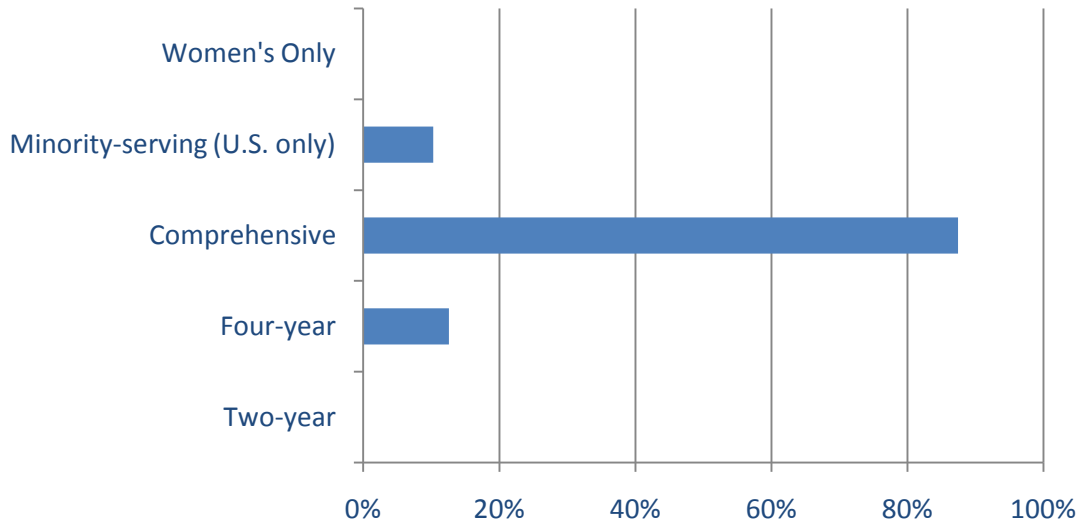


Table 1. *Participant fields of study and areas of concentration*

Field of Study	Concentration	# Participants
Agricultural Sciences/Natural Resources	Environmental Science	1
Biological/Biomedical Sciences	Biochemistry	5
	Biology/Biological Sciences, General	3
	Biology/Biomedical Sciences, Other	3
	Biomedical Sciences	4
	Biophysics	1
	Biotechnology	1
	Cell/Cellular Biology and History	1
	Developmental Biology/Embryology	1
	Ecology	8
	Evolutionary Biology	8
	Genetics, Human & Animal	1
	Microbiology	2
	Molecular Biology	11
	Neuroscience	1
	Pathology, Human & Animal	1
	Pharmacology, Human & Animal	1
	Zoology, Other	1
	Computer & Information Sciences	Computer & Information Science, Other
Concentration Not Provided		1
Education	Curriculum & Instruction	1
Engineering	Materials Science	1
Health Sciences	Epidemiology	1
Mathematics	Algebra	2
	Applied Mathematics	23
	Mathematical Biology	35
	Mathematical Ecology	8
	Operations Research	1
	Statistics	2
	Concentration Not Provided	8
Physics	Biophysics	1
Unknown/not reported		31

Participants represented 50 different institutions across three countries, including Canada, Nigeria and the United States (U.S). Within the U.S., 23 different states were represented. Included in the institutions was one government institution, 48 colleges/universities, and a high school. Of the 48 different colleges/universities represented, most were classified as comprehensive (having undergraduate and graduate programs) (Figure 2).

Figure 2. Characteristics of participants' colleges/universities (n=48 unique)



The 88 females and 91 males (three of whom self-identified as being of Hispanic/Latino ethnicity) mostly self-identified racially as white (Figures 3 & 4).

Figure 3. Racial composition of program participants (n=179)

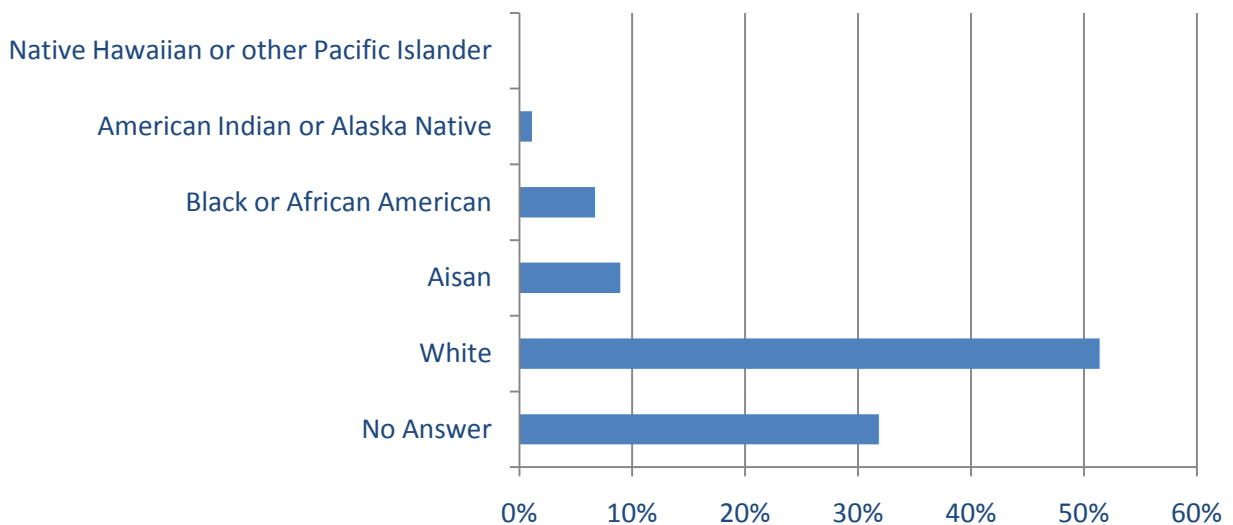
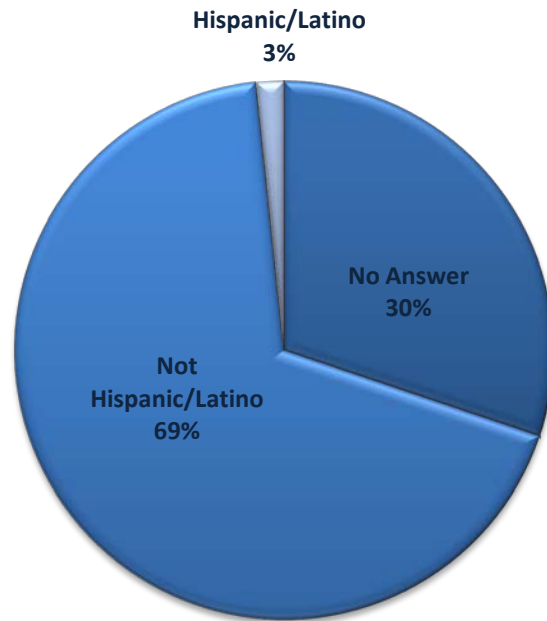


Figure 4. Ethnic composition of program participants (n=179)



## Evaluation Design

### Evaluation Questions

The evaluation of the conference was both formative and summative in nature, in that the data collected from participants was intended to both gain feedback from participants about the quality of the current conference and also to inform future meetings. The evaluation framework was guided by Kirkpatrick's Four Levels of Evaluation model for training and learning programs (Kirkpatrick, 1994<sup>1</sup>). The evaluation questions were developed according to level one of the model, participants' reactions, in order to gather information about how participants felt about the content and format of the conference, as well as the accommodations provided by NIMBioS. Several questions constituted the foundation for the evaluation:

1. Were participants satisfied with the conference overall?
2. Did the conference meet participant expectations?
3. Do participants feel the conference allowed them to make new connections with others in math and biology?
4. Do participants feel they gained a better understanding of undergraduate research happening in mathematical biology?
5. What impact do undergraduate participants feel the conference will have on their future career plans?
6. Were participants satisfied with the accommodations offered by NIMBioS?

<sup>1</sup> From Kirkpatrick, D.L. (1994). *Evaluating Training Programs: The Four Levels*. San Francisco, CA: Berrett-Koehler.

7. What changes in accommodations, group format, and/or content would participants like to see at future similar meetings?

## Evaluation Procedures

An electronic survey aligned to the evaluation questions was designed by NIMBioS' Evaluation Coordinator with input from the NIMBioS Associate Director for Education, Outreach, and Diversity, and Education and Outreach Coordinator. The final instrument was hosted online via the University of Tennessee's online survey host mrInterview. Links to the survey were sent to 175 conference participants (four participants who were affiliated with NIMBioS were excluded from the evaluation) on October 26, 2009. Reminder emails were sent to non-responding participants on November 2 and 5, 2009. By November 12, 2009, 142 participants (77 of whom were undergraduates) had given their feedback, for a response rate of 81%.

An electronic demographics survey aligned to the reporting requirements of the National Science Foundation (NSF) was designed by NIMBioS' Evaluation Coordinator with input from NIMBioS' Director. The final instrument was hosted online via the University of Tennessee's online survey host mrInterview. Links to the survey were sent to the 173 conference participants who had not previously attended a NIMBioS event on October 14, 2009. Reminder emails were sent to non-responding participants on October 19 and 22, 2009. By October 25, 2009, 121 participants had filled out the survey for a response rate of 70%. Demographics questions regarding gender, race, and ethnicity, and disability status were optional (disability status is not reported in this evaluation report). All demographic information is confidential, and results are reported only in the aggregate. When feasible, the evaluator filled in missing demographic data from other documents (e.g. address, institution, field of study). The evaluator did not assume race, ethnicity, or disability status for any participant who did not report this information.

## Data Analysis

Data from the electronic surveys included both forced-response and supply-item questions. All data were downloaded from the online surveys host into the statistical software package SPSS for analysis. Quantitative data were analyzed using SPSS, while qualitative data were analyzed in SPSS Text Analysis for Surveys. Qualitative responses were categorized by question and analyzed for trends.

## Findings

### Overall Satisfaction

Overall satisfaction with the conference was high among respondents, the majority of whom indicated they either agreed or strongly agreed that the conference was very productive (86%) and met their expectations (88%). Some general participant comments:

*"The conference was well organized. The quality of the student and faculty presentations was high. Overall, the conference was a valuable experience for us."*

*“I met students from other Universities, and we spoke about the different projects that we are working on. I am still communicating with most of the people I met at the conference. It was great.”*

*“The meeting was a great opportunity to see how others are training students to work at the interface of math and biology. I took away several strategies that are working well for others which I will use with my students. More dedicated time for the participating faculty to discuss curricula and student research training would have been appreciated.”*

*“I was truly impressed with the organization of this conference and would consider it a model for the years to come.”*

Most respondents thought the presentations were useful (87%), while a smaller majority felt the panel discussions were useful (73%). Additionally, 91% of respondents either agreed or strongly agreed that they would recommend participating in NIMBioS conferences to their colleagues (Table 2).

Table 2. Respondent levels of satisfaction with various aspects of the conference

	<i>n</i>	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I feel the conference was very productive.	142	40%	46%	11%	1%	0%
The conference met my expectations.	142	38%	50%	8%	3%	0%
The presentations were useful.	142	33%	54%	11%	2%	0%
The panel discussions were useful.	142	29%	44%	13%	8%	2%
I would recommend participating in NIMBioS conferences to my students and/or colleagues.	142	54%	37%	7%	1%	0%

### ***Satisfaction with Accommodations***

Overall, respondents reported being satisfied with the comfort and resources of the conference facility, as well as the quality of meals provided (Table 3). Only minor complaints were made regarding accommodations, including several participants who felt the venue was too cold, or wanted more vegetarian/healthier food options. Some participant comments:

*“The administrative/food arrangements were, honestly, the best of any meeting that I have attended. Thank you for taking such good care of us.”*

*“This conference was great. I just hope this wonderful tradition can be continued each year.”*

*“I’ve been to several conferences and none of them provided us with the amount or quality of food and snacks that this conference provided. I greatly appreciate the constant supply of hot*

*coffee, water, tea, etc. The main change I would have made was that the conference was exceptionally cold...”*

Table 3. Respondent levels of satisfaction with conference accommodations

<b>Please indicate your level of satisfaction with the conference accommodations:</b>	<i>n</i>	Very satisfied	Satisfied	Neutral	Dissatisfied	Strongly dissatisfied
Comfort of the conference facility	142	62%	34%	2%	1%	0%
Resources of the conference facility	142	61%	34%	4%	1%	0%
Quality of meals	142	63%	26%	7%	2%	0%
Quality of drinks and snacks provided	142	66%	25%	7%	2%	0%

### Conference Content and Format

#### *Most Useful Aspects*

Most respondents felt the most useful aspect of the conference was the student presentations, followed by the good atmosphere for student interaction and the career panel (Figure 5). The opportunity for networking among faculty was also a commonly found theme among faculty responses for the most useful aspect of the conference. Many undergraduate respondents said they were happy to have the opportunity to see and practice presenting research in a venue of their peers:

*“Presenting to people like myself-- an undergraduate with an interest in the math and sciences-- allowed for connections.”*

*“[The best part of the conference was the ] venue to practice presenting research.”*

*“Listening to short talks from other students in my age group. I learned a lot not only about their research topics, but also how to give talks about my research in the future.”*

While reviews were mixed over the effectiveness of the career panel, several respondents did indicate that it was the highlight of the conference for them:

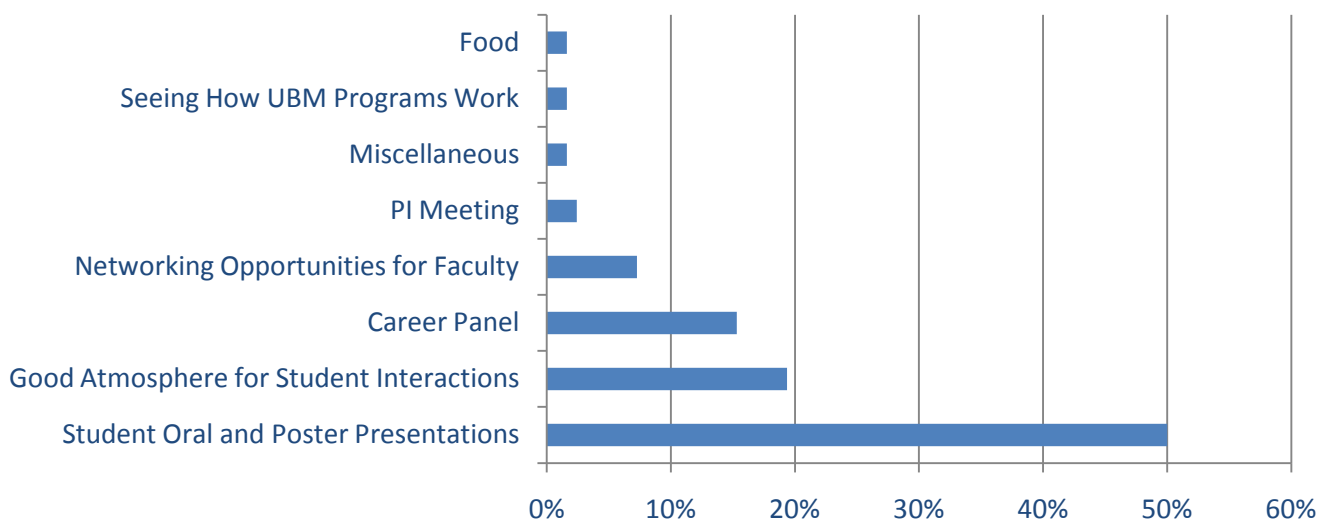
*“I was able to see the wide range of possibilities of things that I can study as an undergraduate.”*

*“I feel that the panel discussion was amazingly useful for undergraduate students.”*

*“I felt the panel did a really nice job at interpreting what they recognize as important when applying to graduate schools.”*



Figure 5. Respondent designated most useful aspects of the conference (n=124)



### ***Undergraduate Participant Learning***

Undergraduate participants were asked several questions to gauge their learning experience during the conference. Ninety-five percent of undergraduate respondents said they felt that participating in the conference helped them become more knowledgeable about undergraduate research going on at the interface of biology and math. Respondents also reported relatively high levels of learning about how to present scientific research. Learning gains, however, were slightly lower regarding career opportunities at the interface of mathematics and biology (Table 4). Of the respondents who felt “neutral” or “disagreed” that they learned anything about career opportunities, the most common complaint was that the career panel contained too little diversity with regard to types of careers available:

*“The career workshop panel should be a little more diverse so that the students will know there are many career options. The panel should also include those careers that are unprecedented but may fit those students who are not interested in academia and/or medicine.”*

*“Most of the speakers during the panel discussion, were talking about teaching. They omitted some other working opportunities like actuarial science., It would be better if next time, a different variety of math and biology professionals are invited so that they can touch many different aspects of the different subjects.”*

*“It would be nice if someone can have a seminar or anything that has to do with giving information to students about what they can do after getting their degree. Because not everyone plans to go to graduate school right away. Some of us are looking for jobs and we have nowhere to turn to. So it would be nice if I can get information on what I can do with my degree.”*

Table 4. Undergraduate respondent learning levels

As a result of participating in this conference, I have a better understanding of:	<i>n</i>	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Undergraduate research going on at the interface of biology and math	74	55%	39%	5%	0%	0%
How to present scientific research	74	54%	32%	11%	3%	0%
Career opportunities at the interface of mathematics and biology	74	34%	46%	15%	4%	1%

### Progress Toward Goals

Ninety-two percent of respondents felt the conference format was effective. The majority of respondents (97%) agreed that the conference made adequate progress toward its goal of creating a forum through which undergraduates can present research and make new connections at the interface of math and biology. Some participant comments:

*“The level of presentations was proper for an undergraduate. My students get a lot of information from their peers and from the graduate student present there.”*

*“At both the talks and the posters, my research students made connections with others.”*

*“I believe the conference was a success in providing a forum for undergraduates to present research and make new connections. The students that attended from our institution enjoyed the undergraduate presentations and also their personal interaction with the other researchers.”*

While most respondents felt the conferences allowed students to make new connections, some suggested adding time to the conference format specifically for student interactions with each other and participating faculty:

*“Although I would like to have seen more mingling time so that the students could have met the each other and faculty in an informal atmosphere.”*

*“Need more social events designed to get students to talk to each other outside of their regular contacts....”*

*“Almost perfect. There should have been some mingling time so the students could have met each other and the faculty.”*

### Conference Impact

The majority of conference participants (86%) said they felt that participating in the conference helped them make connections with others within the interdisciplinary field of math and biology. Many respondents said the conference was a great venue for networking with others with similar interests:

*"I met students from other Universities, and we spoke about the different projects that we are working on. I am still communicating with most of the people I met at the conference. It was great."*

*"This was a good networking event for faculty as well."*

*"I have met many individuals with similar interests at the NIMBioS conference whom I am now in contact with; this conference was truly rewarding in that regard!"*

Other participants pointed out that the conference was an opportunity to learn from their peers about a variety of areas related to math biology:

*"It was very useful to see the different projects that are ongoing at institutions that are focusing on the interface between mathematics and biology. I also feel that I have gained a better understanding of the goals of NIMBioS and the NSF in regard to fostering collaborations between mathematics and biology."*

*"I was able to do a lot of networking, and not just with fellow students, but also with mentors and others. I gained a lot of information about attending grad school, and options for grad school."*

*"The meeting was a great opportunity to see how others are training students to work at the interface of math and biology. I took away several strategies that are working well for others which I will use with my students. More dedicated time for the participating faculty to discuss curricula and student research training would have been appreciated."*

Although most participants said they were able to make connections with others at the conference, several indicated they would have liked to have had a scheduled time to meet the principle investigators (PIs) and/or NSF program officers:

*"...It would have been nice to do introductions at the UBM PIs meeting. Alternatively, have the PIs gather into smaller groups of perhaps 5-10 people and allow the group members to introduce themselves and give some background and experiences working with the UBM grants. Then some time for discussion within the group and then a large group discussion would be good. Also, having the PIs meeting on the first day would have made it much easier for the PIs who are in their first year and may not know many of the other people at the meeting an easier transition time."*

*"No time was scheduled for PI interactions except for one session on assessment. There were no meetings scheduled with NSF Program Officers. It may have been great for the undergrads, but as a PI, it wasted three days of my busy schedule."*

*"There was no planned meeting for PI, Co-PIs to exchange ideas. Scheduled PI meeting was devoted to planned presentation and some discussion. I would have liked to see an informal meeting of PI's sharing their success/failure to others. This would have been more beneficial. "*

In addition to making new connections in the field, eighty-one percent of undergraduate respondents said they felt that the exchange of ideas that took place during the conference would (or potentially would) influence their career plans. Respondents said networking with those studying and working in mathematical biology gave them a unique opportunity to learn more about available careers in the industry. Several undergraduates indicated the experience caused them to change their career plans:

*“As a result of this conference, I plan to become a mathematics professor and conduct research involving mathematical biology.”*

*“Now I am going to be a math biologist.”*

*“The comments by one audience member during the panel discussions on careers in math-bio got me interested in consulting.”*

*“The comments by one audience member during the panel discussions on careers in math-bio got me interested in consulting.”*

*“I had been deciding whether or not to pursue a PhD program, which i now believe i will pursue, but i have also decided to focus more towards mathematics in ecology, rather than bacterial systems, which was my focus this summer.”*

Other undergraduate participants indicated that, while the conference did not solidify a change in their career plans, it did make them more aware of the variety of careers available at the interface of math and biology:

*“The panel helped me consider other options besides teaching at a university level.”*

*“It is true that NIMBioS and other Math-Bio programs have influenced me. I was not nearly as interested in the biological sciences before-hand. I still plan to apply math to chemistry, but there is plenty of material and research at the boundary between all 3- math, chemistry, and biology that I would love to explore.”*

*“Didn't realize how many projects the Great Smoky Mountains National Park overlooked. I think I would greatly enjoy somehow contributing to a park service through either an internship or job.”*

*“While listening to a few presentations, I got some ideas on where I can look for internships after I graduate.”*

Still other participants said the experience either solidified their career plans or made them more interested in pursuing graduate school:

*“I was exposed to new methods of analysis and areas of study that I had not realized previously were so fascinating. I plan to pursue them further in graduate study.”*

*“[Participating in the conference] made me confident in my decision to go to grad school.”*

*“[Participating in the conference] solidified that this is the path I want to do for the rest of my life.”*

## Suggestions for Future conferences

Respondents made several suggestions for improving future conferences. Several themes emerged from analysis of these suggestions, including a more diverse career panel, having planned social events, and changes to the poster session. Suggestions for the career panel included having more people on the panel from business/industry, including people from a wider range of disciplines within academia, and having more of a balanced emphasis between choosing graduate school and going directly into the workforce after completing one's undergraduate career. Some participant comments:

*"I don't feel like I really learned about jobs outside of academia that I could possibly do. And also I felt that there was a lot of talk about how to get into grad school (which was helpful) but not really why I would want to go."*

*"Bring in a "Careers in Math-Biology" panel that had a more diverse work history. The panel was biased in favor of faculty careers."*

*"The career panel needed to have representations from a variety of fields. Why not have someone from the NSA or other agencies, USFWS, NASA etc that could inform students about their jobs and the math and bio."*

*"[P]lease include professionals from different sectors of the industry to be on the career guidance panel. You can also include a career fair were companies advertise and offer employment opportunities to students. Skills needed for those careers?"*

*"A more industry-friendly discussion of careers in math-biology. The tenor of the panel discussion left a bad taste in the mouth of students intending to go to medical school or to work in industry, as it came across as though all options that did not include graduate school were less-than-desirable."*

Some respondents suggested it would also be useful to have scheduled social activities for students to create more opportunities for networking and learning about other research programs:

*"The presentation aspect of the conference was perfect in my opinion. I believe however, that the coordinators should arrange a social event prior to the start of the meeting or give students an opportunity to meet each other and discuss more intimately, what type of research they are carrying out. I believe that this form of "bonding" would allow students to obtain new contacts, as well as new friends."*

*"I would incorporate more social activities for the students that would provide for the necessary networking opportunities."*

*"I think a student mixer would be good. I didn't see as many students taking the opportunity to get to know students from other schools as I would have liked."*

Likewise, several PIs suggested they would have liked a scheduled social activity to get to know one another as well:

*“Try to encourage more interaction among PIs - some sort of introductory “getting to know you” type session. Prior to the PI’s meeting, I felt a little isolated.”*

*“Have an informal meeting of PI’s sharing their success/failure to others.”*

Several respondents made suggestions for the poster session. Many indicated that the poster presentation session was the most useful aspect of the conference, and thus requested that this part of the conference be expanded in the future. Moving the poster session to an earlier timeslot was a common request, as was having a competition for best poster and/or student presentation. Some participant comments:

*“I would have liked my presentation or poster to have been judged/critiqued. Ideally I would like to see an awards ceremony for particularly interesting and well-presented research, but if this is not possible, just having a rubric that described what I did right and how I could improve would have been helpful. I know that I have presented my research, and I feel I did it well, but if I made a mistake I would like to know, so that I don’t make that same mistake at the next conference I attend.”*

*“Ma be start giving a best presentation award. I realize it will be hard to judge given the diversity of presentations, but such an award will be a big motivation for the students to give great presentations. Maybe another award for the best poster.”*

Another common suggestion from faculty respondents was to change the time of the PI meeting. Respondents indicated having the meeting earlier in the meeting would enable them to better develop relationships during the meeting, and interfere less with student presentations:

*“Have the PIs meeting earlier so that connections can be made early and developed over the course of the two days”*

*“It was unfair to undergraduate speakers to pull the UBM faculty out of talks for the UBM Conference. I would prefer that the UBM Conference had been later on Saturday or else Sunday morning.”*

*“Not having the PI meeting during talks, better retain attendance for afternoon and final presentations”*

Other miscellaneous suggestions included having more vegetarian food options, shortening the conference to just one day, and organizing presentations by discipline area. For a complete list of all respondent suggestions, see appendix C.

## Conclusions and Recommendations

Overall, participants felt the conference was successful. Survey respondents were satisfied with the overall event, indicating that it was a productive experience that met their expectations. Respondents were also satisfied with the conference accommodations.

The conference represented a diverse group of participants regarding gender, race, geographic dispersion, and primary field of study; however, little diversity existed in the reported ethnic composition of the group. While only 3% of respondents reported being of Hispanic/Latino ethnicity, it should be noted that this number may not fully reflect the number of participants in this demographic as 30% of participants chose not to provide NIMBioS with this optional information.

Almost all undergraduate respondents said they felt that participating in the conference helped them become more knowledgeable about undergraduate research going on at the interface of biology and math. Respondents also reported relatively high levels of learning about how to present scientific research. Learning gains, however, were slightly lower regarding career opportunities at the interface of mathematics and biology. Of the respondents who felt “neutral” or “disagreed” that they learned anything about career opportunities, the most common complaint was that the career panel contained too little diversity with regard to types of careers represented.

The majority of respondents agreed that the conference made adequate progress toward its goal of creating a forum through which undergraduates can present research and make new connections at the interface of math and biology. While most respondents felt the conference allowed students to make new connections, some suggested adding social functions to the program to facilitate student interactions with each other and participating faculty.

The majority of conference participants said they felt that participating in the conference helped them make connections with others within the interdisciplinary field of math and biology. Many respondents said the conference was a great venue for networking with others with similar interests. In addition to making new connections in the field, a majority of undergraduate respondents said they felt that the exchange of ideas that took place during the conference would (or potentially would) influence their career plans. As a result of their experiences during the conference, several undergraduates decided to pursue a career in the area of mathematical biology, while others indicated they felt the conference gave them more information about careers in the field that would potentially influence their career choices in the future.

Respondents made several suggestions for improving future conferences. Several themes emerged from analysis of these suggestions, including a more diverse career panel, having planned social events, and changes to the poster session. Many respondents indicated that the poster presentation session was the most useful aspect of the conference, and thus requested that this part of the conference be expanded in the future. Other suggestions included having more vegetarian food options, shortening the conference to just one day, and organizing presentations by discipline area.

Based on analysis of participant response data, the recommendations for future conferences are as follows:

- Overall, participants were satisfied with the conference accommodations. No recommendations are necessary here. For miscellaneous participant suggestions, see Appendix C.
- The inclusion of a career panel was very helpful to many undergraduate participants. For future panels, consider adding members from business/industry, as well as people from a wider range of disciplines within academia.
- Regarding the career panel also, consider also having more of a balanced emphasis between choosing graduate school and going directly into the workforce after completing one's undergraduate career as many participants expressed interest in learning more about careers available to those with only undergraduate degrees.
- Consider scheduling social activities into the agenda for the next conference if possible. Several activities were requested by participants including:
  - A mixer for undergraduates only
  - A reception for faculty/Pis only
  - An event designed for undergraduates to get to know faculty/Pis from other institutions
- Look into expanding the poster session for future conferences, as this was a highlight for many participants. Consider scheduling the session earlier in the day, however, if possible.
- Consider having a poster and/or presentation competition with an awards ceremony at the conclusion of the conference.
- If possible, consider having the PI meeting earlier in the conference to enable PIs to better develop relationships during the meeting, and interfere less with student presentations.



## **Appendix A: List of Participants**

## Participants

<u>Last name</u>	<u>First name</u>	<u>Institution</u>
Ackleh	Azmy	University of Louisiana Lafayette
Agusto	Folashade	NIMBioS
Alexander	Jasmin	University of North Carolina Greensboro
Allen	Deborah	National Science Foundation
Allen	Laura	University of Nebraska Lincoln
Antolin	Michael	Colorado State University
Arnold	Kierstin	East Tennessee State University
Aten	Tyler	University of Vermont
Baker	Quintana	University of Nebraska Lincoln
Barner	Roshonda	North Carolina A&T State University
Bean	Andrew	Colorado College
Bennett	Crystal	North Carolina A&T State University
Bewick	Sharon	NIMBioS
Bodine	Erin	University of Tennessee Knoxville
Bokosha	Mike	Marymount University
Brandon	Madison	University of Tennessee Knoxville
Branigan	John	University of Hawaii Manoa
Brassil	Chad	University of Nebraska Lincoln
Brooks	Jeremy	East Tennessee State University
Brostoff	Noah	Colorado College
Brown	David	Colorado College

<u>Last name</u>	<u>First name</u>	<u>Institution</u>
Brown	Emily	East Tennessee State University
Burks	Janeise	Fisk University
Cameron	Sharon	East Tennessee State University
Campbell	Malcolm	Davidson College
Carroll	David	Florida Institute of Technology
Carten	Lydia	James Madison University
Chhetri	Maya	University of North Carolina Greensboro
Chiu	Chichia	Michigan State University
Comes	Jenna	University of Nebraska Lincoln
Connor	Edward	San Francisco State University
Cool	Robert	Missouri Western State University
Crouthers	Derek	East Tennessee State University
Crowe	Mary	University of North Carolina Greensboro
Curll	Lisa	Youngstown State University
Dabbs	Kathryn	University of Tennessee Knoxville
Deeds	Ryan	Dickinson College
Derocher	Michael	University of Hawaii Manoa
Desu	Suma	University of Vermont
Ding	Wandi	Middle Tennessee State University
Echlin	Moriah	Colorado State University
Eckdahl	Todd	Missouri Western State University
Emanuel	Christina	Youngstown State University

<u>Last name</u>	<u>First name</u>	<u>Institution</u>
Fassino	Steven	University of Tennessee Knoxville
Ferguson	Revorn	North Carolina A&T State University
Fister	Renee	Murray State University
Ford	Alice	University of Vermont Burlington
Forrester	Jeffrey	Dickinson College
Fovargue	Rachel	College of William and Mary
Gaff	Holly	Old Dominion University
Gilchrist	Michael	University of Tennessee Knoxville
Goins	Gregory	North Carolina A&T State University
Gomulkiewicz	Richard	Washington State University (Pullman - Main Campus)
Gooding	Ava	East Tennessee State University
Graham	Garrett	University of Richmond
Grosberg	Richard	University of California Davis
Gulbranson	Jessica	Florida Institute of Technology
Hamilton	Ian	Ohio State University Columbus
Harris	Paul	Michigan State University
Hayes	David	Truman State University
Haynes	Sekeenia	University of Tennessee Knoxville
Hegde	Mandira	Case Western Reserve University
Hendon	Raymon	Middle Tennessee State University
Heyer	Laurie	Davidson College
Hirai	Kelsi	Brown University

<u>Last name</u>	<u>First name</u>	<u>Institution</u>
Hobson	Julia	University of Vermont
Hom	Carole	University of California Davis
Hoover	Alexander	Case Western Reserve University
Hopkins	David	Colorado State University
Horn	Mary Ann	National Science Foundation
Hota	Sanjukta	Fisk University
Howard	Michael	Michigan State University
Howard	Hillary	Youngstown State University
Huntly	Nancy	National Science Foundation
Jalics	Jozsi	Youngstown State University
Jeffers	Tess	Michigan State University
Johnson	McKayla	East Tennessee State University
Johnson	Corey	Truman State University
Jungck	John	Beloit College
Kalik	Zane	Youngstown State University
Kamta	Eric	Marymount University
Kasofsky	David	University of Vermont Burlington
Keegan	Lindsay	University of Florida
Kendrick	Russell	University of Houston Downtown
Kerkhoff	Drew	Kenyon College
Khattach	Shazia	Marymount University
Knighten	Brionna	Jackson State University

<u>Last name</u>	<u>First name</u>	<u>Institution</u>
Knisley	Jeff	East Tennessee State University
Kojouharov	Hristo	University of Texas Arlington
Koksal	Semen	Florida Institute of Technology
Korbach	Hannah	Marymount University
Koseva	Boryana	Truman State University
Koslowsky	Donna	Michigan State University
Krishnamoorthy	Bala	Washington State University Pullman
Kwembe	Tor	Jackson State University
Lancaster	Evan	Blackman High School
Langarica	Alicia	University of Texas Arlington
Lau	Kin	Davidson College
Leary	Chris	State University of New York Geneseo
Ledder	Glenn	University of Nebraska Lincoln
Lee	Namyong	Minnesota State University Mankato
Leonard	Rebecca	East Tennessee State University
Lipan	Ovidiu	University of Richmond
Lisi	Marsida	University of Houston Downtown
Llera	Kristie	Florida Institute of Technology
Lockwood	Svetlana	Washington State University Pullman
Long	Robert	Kenyon College
Long	Andrew	Northern Kentucky University
Lorusso	Amanda	James Madison University

<u>Last name</u>	<u>First name</u>	<u>Institution</u>
Lyman	Kyle	University of Tennessee Knoxville
Mai	Anthony	University of Louisiana Lafayette
Manning	Carly	East Tennessee State University
Martinez	Marco	University of Tennessee Knoxville
Maxey	Martin	Brown University
Mike	Joshua	Youngstown State University
Miller	Jason	Truman State University
Mopper	Susan	University of Louisiana Lafayette
Ng	Raymond	Brown University
Niccum	Brittany Ann	Florida Institute of Technology
Omattage	Natalie	University of Richmond
Parise	Robert	Youngstown State University
Park	Miran	University of California Davis
Pawelec	Kendell	Michigan State University
Perkins	Alex	University of California Davis
Phan	Miranda	University of Houston Downtown
Pilaroscia	Tina	University of Houston Downtown
Pinter	Gabriella	University of Wisconsin Milwaukee
Poet	Jeff	Missouri Western State University
Qian	Lei	Fisk University
Rainwater	Tabatha	University of Tennessee Knoxville
Rebouh	Mousa	San Francisco State University

<u>Last name</u>	<u>First name</u>	<u>Institution</u>
Richards	Harry	University of Tennessee Knoxville
Rivera	Marissa	Florida Institute of Technology
Roberts	Michael	Dickinson College
Rodger	Rebecca	Samford University
Rodriguez	Grayson	Northern Kentucky University
Rogers	Ben	Colorado College
Rogerson	Lindsay	Jackson State University
Rommel	Casey	Colorado College
Ross	Chelsea	East Tennessee State University
Ross	Valery	University of Ottawa
Rushing	Shunda	University of North Carolina Greensboro
Ryan	Phil	Truman State University
Rychtar	Jan	University of North Carolina Greensboro
Salinas	Rene	Appalachian State University
Sander	Elizabeth	University of Vermont
Schaefer	Elsa	Marymount University
Schraiber	Joshua	University of California Davis
Schugart	Richard	Western Kentucky University
Schulte	James James	Clarkson University
Signor	Emily	University of Nebraska Lincoln
Simmons	Jammal	Jackson State University
Sinden	Richard	Florida Institute of Technology



<u>Last name</u>	<u>First name</u>	<u>Institution</u>
Smith	Caitlin	University of Richmond
Snyder	Robin	Case Western Reserve University
Solaiman	Adnan	Dickinson College
Stevens	Lori	University of Vermont
Sutton	Jasmin	East Tennessee State University
Svoboda	Julia	University of California Davis
Swaddle	John	College of William and Mary
Tavener	Simon	Colorado State University
Taylor	Leland	Davidson College
Tecarro	Edwin	University of Houston Downtown
Tenekedjieva	Ana-Maria	Duke University
Tracht	Samantha	Capital University
Vazquez	Mariel	San Francisco State University
Vig	Dgruv	Kenyon College
Wallace	Ato	Fisk University
Walton	David	James Madison University
Wang	Jin	Old Dominion University
Washington	Marvin	Jackson State University
Willoughby	Brenton	University of Nebraska Lincoln
Wilson	Leslie	University of Hawaii Manoa
Wright	Moriah	Youngstown State University
Yampolsky	Lev	East Tennessee State University

<u>Last name</u>	<u>First name</u>	<u>Institution</u>
Yates	George	Youngstown State University
Zhu	Xiao	Missouri Western State University
Zingarelli	Erin	Florida Institute of Technology
Zink	Landon	East Tennessee State University

**Organizers of conference: Suzanne Lenhart and Sarah Duncan, NIMBioS**

## **Appendix B: UBM Conference Survey**

## Undergraduate Research Conference at the Interface Between Biology and Mathematics Evaluation Survey

Thank you for taking a moment to complete this survey. Your responses will be used to improve the conferences hosted by the National Institute for Mathematical and Biological Synthesis. Information supplied on the survey will be confidential, and results will be reported only in the aggregate.

Are you an undergraduate student?

Yes

No

How did you hear about this conference?

Please check the appropriate box to indicate your level of agreement with the following statements about this conference:

*(Strongly agree, Agree, Neutral, Disagree, Strongly disagree, Not applicable)*

I feel the conference was very productive.

The conference met my expectations.

The presentations were useful.

The panel discussions were useful.

I would recommend participating in NIMBioS conferences to my students and/or colleagues.

Please check the appropriate box to indicate your level of agreement with the following statements. As a result of participating in this conference, I am more knowledgeable about:

*(Strongly agree, Agree, Neutral, Disagree, Strongly disagree)*

undergraduate research going on at the interface of biology and math.

how to present scientific research.

career opportunities at the interface of mathematics and biology.

Do you feel that participating in the conference helped you make connections with others within the interdisciplinary field of math and biology?

Yes

No

Do you feel the conference was successful in achieving its goal of creating a forum through which undergraduates can present research and make new connections at the interface of math and biology?

Yes

No

Do you feel that the exchange of ideas that took place during the conference will influence your career plans?

Yes

No

Possibly

Please explain impact on career plans:

What do you feel was the most useful aspect of the conference?

What would you change about the conference?

How do you feel about the format of the conference?

This was a very effective format

This was not a very effective format

The conference format would have been more effective if:

Please indicate your level of satisfaction with the conference accommodations:

*(Very satisfied, Satisfied, Neutral, Dissatisfied, Very dissatisfied, Not applicable)*

Comfort of the facility in which the conference took place

Resources of the facility in which the conference took place

Quality of meals

Quality of drinks and snacks provided

Please indicate any changes NIMBioS can make to improve the resources and/or accommodations available to conference participants:

Please provide any additional comments about your overall experience with the conference:

NIMBioS will send two reminder emails to conference participants who have not responded to this survey. If you would like to be excluded from these reminder emails, please enter your name below.

Your survey results will still remain confidential and your name will not be associated with any of your responses in reporting of survey results.

Your survey results will still remain confidential and your name will not be associated with any of your responses in reporting of survey results.

Your survey results will still remain confidential and your name will not be associated with any of your responses in reporting of survey results.

Name:

## **Appendix C: Open-ended Survey Responses**

## Open-ended Survey Responses

### How did you hear about this conference? (n=137)

*Word-of-mouth/Colleague (67)*

From NIMBioS associate director, Suzanne Lenhart

Professor at East Tennessee State University

After Participating in our schools UBM affiliated program (MBUR, "ember"). Our entire group went to the conference. Essentially, we were told by our PI, Dr. George T. Yates.

Through my advisors at UBM group

From my professors and friends.

from my colleagues

I received an email from the utk math majors list serv.

email from colleague

My mentor.

professor

Dr. Lenhart told me

Through my research adviser, whom I have been working with since May 2009.

Faculty

I heard about this conference from a faculty.

Invited to be on panel by Eric Marland.

The head of the math department at Jackson State University informed me of the conference.

Through my academic adviser.

My advisor at Samford University

Dr. Suzanne Lenhart

Through colleagues in math/bio

My research advisor Dr. Brian Walton.

From a colleague, Semen Koksal, Professor of Mathematics at the Florida Institute of Technology

From my mentor

My PI let our team know about the conference.

My Professor that I am doing research with.

Department Chair of Mathematics, Jackson State University

Faculty member

from my professor

Through my professors with whom I had been working on our research.

My research advisor at East Tennessee State University, Dr. Jeff Knisley

In an NSF Research Grant through BMU, and was told through the PI-Dr.Kokal to attend

My adviser, Alun Lloyd, from my REU at NC State University.

I am part of the TEQB program I am involved in. My professor's suggested that I should go in order to learn how such conferences are conducted and how to present my research when it comes time to.

From Scale-IT workshop and Dr. Lenhart

Through a Professor at Marymount University.

my mathematics professor

MY research advisor

It was advertised to my advisors, who then asked if our research group would be interested in participating.

I was told by one of the mentors in the Math-Bio group

Mentor

Mathematical Biology Program Director.

Through my advisor.

The principle investigator of my research project

My TEQB leader told us about the opportunity

From my research supervisor

My research professor received the email from the program.

I did summer research with Dr Ding who told me about it.

Heard the news from a seminar given by Dr. Suzanne Lenhart and Dr. Cynthia Patterson in Fisk University



Biology Professor recommended going.

Through my biomath advisors

From the Math Biology PI at the University of Hawaii.

I heard about the conference from my mentor.

From my research advisor

UBM advisor

From a Colleague

Dr. Lori Stevens told us in Math-Bio about it.

from my professor

One of my research mentors told me about it.

Faculty

Through a professor

Went to the NIMBioS website and colleagues

The P.I. of my research group.

Through a professor.

Through my professor and our grant.

Professor at UC Davis

I heard about the conference from the NIMBioS REU program and my professor

From a faculty member.

*UBM, NSF, or Other Organization (56)*

Invited/required to attend by the NSF UBM program

I am the PI on a UBM grant from NSF

The meeting was a UBM-PI meeting (I am a PI on an NSF-UBM grant)

Have a UBM grant at our University

via UBM program

e-mail from NSDF program officers

NSF UBM program officers and mathematics faculty colleagues.

The PI of our MBUR program gave us information on the NIMBioS conference as we had completed bio/math research this past summer.

Through our UBM program at school

NSF

It was a UBM PI meeting, so I heard about it from the NSF.

UBM PI meeting information

UBM PI e-mail list, replacement of TIMBER conference

NSF PI list mailing

Through the UBM network. And Suzanne.

My UBM mentor

From the NSF UBM program officers.

From an email a few weeks ago, forwarded to me by another UBM PI

I heard about NIMBioS through my UBM advisor at Michigan State University

Through the UBM program at my university

through the NSF-UBM Program Directors

I am CO-PI of a UMB Grant, and the PI of the grant informed members of this meeting.

NFS program officers.

Through the NSF UBM PI meeting, which was held during this conference.

Through NSF program managers for UBM program

From the NSF UBM program officer

Through the Talent Expansion in Quantitative Biology program at East Tennessee State University.

I am a UBM PI.

School

My university was previously funded by UBM

From program director of the National Science Foundation.

my undergraduate research founded under NSF

Through the Bio/Math (Mathematics Biology Undergraduate Research) program at my university (Youngstown State).

It was displayed as part of the Math-Bio program at my school.

UBM PI, and I Nimbios advisory board member

I am a Co-PI of an UBM grant.

I have a UBM grant and attended the conference to meet with the other PIs and our program director.

From NSF-UBM officers

From the NSF UBM program.

E-mail from the UBM program officers at NSF.

Through the TEQB scholarship program that I am in at ETSU

E-mail from NSF UBM program

UBM PI conference: NSF

from the NSF program manager of our UBM grant

Through the UBM program

UBM Program Director email

The UBM Biomath program at my school.

I am a PI on an NSF UBM grant.

From NSF; I'm PI of an NSF-UBM grant and attended the PI's meeting which was concurrent with the Undergraduate Research Meeting.

via NSF as I am co-PI on NSF MathBio grant

UBM advisor recommended our attendance

Thru the Talent Expansion in Quantitative Biology program at East Tennessee State

Mathematical Biology program at UVM.

From the NSF program manager of the UBM program.

The PI for the grant I work on.

Required for UBM PIs.

*NIMBioS (10)*

NIMBioS website/Google search

from a faculty member at Nimbios

NIMBioS email

Email from NIMBioS staff

NIMBioS website

At NIMBioS

Contact by NIMBioS

NIMBioS website

NIMBioS website

I participated in the REU this summer at Nimbios. So, through Nimbios I was contacted. Plus I am a UT student, so I heard about it from some professors

#### *Miscellaneous (4)*

email

Timber Last Year

By email

I was invited to speak about research I did while an undergraduate

#### **The conference format would have been more effective if: (n=11)**

##### *Changes to Presentation Format (7)*

The last presentations were presented to professors as well.

Covered in my response to previous question. More posters, fewer oral presentations, some workshops on quantitative/numerical/programming tools

There was a better way to find student posters...a system where folks are given a poster board # so that you could then find a specific poster you wanted to see. Most poster board displays were needed.

Again, divide up the talks by topic. There were a lot of talks on SIR models that I thought could have been grouped together, so that people who weren't involved in that kind of research could attend the other talks.

See previous comments. I thought the forum for the undergraduates was great and could be continued with little modification but did not gain much for PIs. Although the presentations on assessment were somewhat useful.

Shorter talks, more posters, more time for informal discussions.

The poster session should have been in a more organized room.

#### *More Time for PI Interaction (2)*

More scheduled time for PI discussions and sharing of experiences.

MORE PI involvement.

#### *More Social Time (2)*

Promote conversations among people, in informal ways., Put it on one day--too expensive to come all that way, for several days, to have the equivalent of one day of talks.

more time to interact with others and not have presentations going on all the time.

### **Do you feel that participating in the conference helped you make connections with others within the interdisciplinary field of math and biology? (n=19)**

#### *Useful For Networking (9)*

I am a biologist. I enjoyed meeting and talking with math colleagues. I also enjoyed hearing the student presentations.

Many young scientists and mathematicians. It was nice to meet people with similar interests as my own in one forum., As for making connections with Professors and PI's, I do not believe this was coordinated very well. Had I more initiative, it could have been more productive in this respect.

I met student from other Universities, and we spoke about the different projects that we are working on. i am still communicating with most of the people i met at the conference. It was great.

This was a good networking event for faculty as well.

i enjoyed the conference very much and the connection i made there will be very useful in my future. thank you for the opportunity.

I have met many individuals with similar interests at the NIMBioS conference whom I am now in contact with; this conference was truly rewarding in that regard!

great student interactions, which are the most important

I knew networking was a large emphasis and was available. However, I did not use it to the extent that I should have.

Me and my fellow Jacksonians had to leave early from the conference so I did not get a chance to make that many connections

#### *Great Opportunity to Learn (4)*

I had a few questions about UBM and NSF grants. There were people there that could answer them.

It was very useful to see the different projects that are ongoing at institutions that are focusing on the interface between mathematics and biology. I also feel that I have gained a better understanding of the goals of NIMBioS and the NSF in regard to fostering collaborations between mathematics and biology.

I was able to do a lot of networking, and not just with fellow students, but also with mentors and others. I gained a lot of information about attending grad school, and options for grad school.

The meeting was a great opportunity to see how others are training students to work at the interface of math and biology. I took away several strategies that are working well for others which I will use with my students. More dedicated time for the participating faculty to discuss curricula and student research training would have been appreciated.

#### *Want More PI Interactions Scheduled (4)*

But only minimally. It would have been nice to do introductions at the UBM PIs meeting. Alternatively, have the PIs gather into smaller groups of perhaps 5-10 people and allow the group members to introduce themselves and give some background and experiences working with the UBM grants. Then some time for discussion within the group and then a large group discussion would be good. Also, having the PIs meeting on the first day would have made it much easier for the PIs who are in their first year and may not know many of the other people at the meeting an easier transition time.

No time was scheduled for PI interactions except for one session on assessment. There were no meetings scheduled with NSF Program Officers. It may have been great for the undergrads, but as a PI, it wasted three days of my busy schedule.

The focus was on student work, which, in itself, is important. however, I really dislike that NSF sponsors meetings such as these rather than having the students present at discipline-based meetings where they can interact with graduate students, post docs, faculty from other institutions., Having a better name tag system or having the PI meeting earlier in the conference vs. almost the last thing would have been better (IMHO)

There was no planned meeting for PI, Co-PIs to exchange ideas. Scheduled PI meeting was devoted to planned presentation and some discussion. I would have like to see an informal meeting of PI's sharing their success/failure to others. This would have been more beneficial.

#### *Miscellaneous (2)*

Dr. Paul Super from the National Parks Service was especially helpful!

I am pre-med, and we were a little left out of the conference. I agree that this will happen naturally. It would have been nice to see how this could fit into our profession as well.

**Do you feel the conference was successful in achieving its goal of creating a forum through which undergraduates can present research and make new connections at the interface of math and biology? (n=26)**

*Wonderful Chance to Introduce Students to Math and Biology Research (14)*

The conference does a great job of serving this purpose. More importantly it shows students areas for potential graduate study. And, it excites them about research (or so we hope).

Undergraduates had access to a lot of influential faculty from around the country.

Yes, the students did have a chance to present work and meet peers without the pressure of a research conference. There was an open discussion of career options. I would think about sending students to Society of Math Biology or SIAM meetings in the future to get a perspective on research horizons.

This was terrific for getting the two disciplines together.

Yes because for a lot of individuals this was their first time participating in a research conference. It also exposed us to all the possibilities that are available, working with math and biology.

So many neat things presented, from all aspects of biology and math!

My students had a wonderful time, both presenting their research and listening to their peers.

The level of presentations was proper for an undergraduate. My students get a lot of information from their peers and from the graduate student present there.

I was truly impressed with the organization of this conference and would consider it a model for the years to come.

Very much so. It seemed as though a lot of students were doing research of population dynamics AND/OR using the same mathematical tools to model whatever system they were looking at. It would be great if we could get more of a variation on the research topics.

At both the talks and the posters, my research students made connections with others.

Very successful in this regard - a friendly and supportive environment for student presentations.

My students had a wonderful experience.

I believe the conference was a success in providing a forum for undergraduates to present research and make new connections. The students that attended from our institution enjoyed the undergraduate presentations and also their personal interaction with the other researchers.

*Format Suggestions (6)*

It was great. I would hope that in the future there won't be sessions at two different locations at the same time so we don't miss half of the presentations.

However, try to have less population modeling/diff. eqns. based projects and more projects from sys.

bio, syn. bio, etc.

The quality of presentations was uneven

Yes, however i have a few recommendations for improvement, one of which is that the poster session should have been held in at least two cycles, perhaps on each of the two days, so that it would have been less crowded and the students presenting posters would have been less attached to their own and would have had the opportunity to go see other posters.

Again, a better use of funds is to have students present their work at discipline meetings rather than a conference such as this.

This is a wonderful idea and opportunity for undergraduate students interested in this particular field. I think the conference was handled well and efficiently. In the future I would like to see the symposiums divided somewhat topically, even if broadly (for example, "Modeling" or "Ecology"). Also, the poster spots should be greatly expanded.

#### *More Time for Students to Socialize (4)*

The format for presentations was good--very non-threatening to the students., However, the format for making connections wasn't really there.

Although I would like to have seen more mingling time so that the students could have met the each other and faculty in an informal atmosphere.

Need more social events designed to get students to talk to each other outside of their regular contacts....

Almost perfect. There should have been some mingling time so the students could have met each other and the faculty

#### *Felt Excluded (2)*

Only if a student wishes to continue with graduate work, not if a student wishes to get a job or go to Medical school after undergraduate work.

This might have been the case for others, but I was one of very few people who worked with statistics, so I felt left out of much of the discussion.

#### **Please explain impact on career plans: (n=25)**

#### *More Aware of Variety of Careers (8)*

It was good to realize all the job and career opportunities at the interface of math and biology.

The panel helped me consider other options besides teaching at a university level.



math-biology isn't my first choice for a career but i am aware of the demand for it now.

I still plan on working in the field of biology but will be more aware of the application of mathematics in my research.

It is true that NIMBioS and other Math-Bio programs have influenced me. I was not nearly as interested in the biological sciences before-hand. I still plan to apply math to chemistry, but there is plenty of material and research at the boundary between all 3- math, chemistry, and biology that I would love to explore.

Didn't realize how many projects the Great Smoky Mountains National Park overlooked. I think I would greatly enjoy somehow contributing to a park service through either an internship or job.

The presented summer research opportunities definitely caught my interest. The presentations gave me a good insight into what specific projects I may work on in future.

While listening to a few presentations, I got some ideas on where I can look for internships after I graduate.

#### *Resulted in a Change of Career Plans (5)*

At first I wanted to become an oncologist; after entering the field of Biomathematics, I wish to pursue a joint M.D/PhD in cardiology and applied mathematics in the study and modeling of deadly cardiac arrhythmias.

As a result of this conference, I plan to become a mathematics professor and conduct research involving mathematical biology.

Now I am going to be a math biologist

The comments by one audience member during the panel discussions on careers in math-bio got me interested in consulting.

I had been deciding whether or not to pursue a PhD program, which i now believe i will pursue, but i have also decided to focus more towards mathematics in ecology, rather than bacterial systems, which was my focus this summer.

#### *More Aware of/Interested in Graduate School (4)*

Now I know that there is a big number of people that want to work in the interface of biology and math and that funds are available for people who want to do their graduate work in the field.

I now know how wide my options truly are in the field I am majoring in. I also know different classes that I should take to increase my chances at a good graduate school.

I was exposed to new methods of analysis and areas of study that I had not realized previously were so fascinating. I plan to pursue them further in graduate study.

Because it informed me on graduate schools expectations. Also, widen my view on opportunity that are out their having experience working with math and biology.

#### *Limited Career Panel (4)*

The panel for career options was the worst aspect of the conference. They focused solely on graduate school and completely degraded and shot down all other routes for post undergrad careers. I found this pretty offense for my friends pursuing medical school and for myself who has already received numerous offers which proves there are jobs in the math and biology fields and students do not have the only option of graduate school. If this panel had a wider variety on careers then this would have not been so offensive

The panel members kept insisting graduate school and shining medical in a negative light. Luckily one professor suggested that there are many government jobs out there for recent graduates with a degree in math/bio. I was hoping that they would be able to give me more concrete suggestions instead of pushing graduate school.

The panel discussion made me 100% sure that I definitely don't want to get my Masters or PhD, and that I do want to go to Medical school.

I was in the slightly maligned group of "pre-med" students but appreciated the professors who spoke of their collaborations with clinicians. I hope to develop such collaborations in my future career.

#### *Solidified Career Plans (2)*

Made me confident in my decision to go to grad school.

Solidified that this is the path I want to do for the rest of my life

#### *Networking With Others Interested in Area (2)*

I hoped to meet employers and people who are in different industries and jobs.

I had the unique opportunity to network with my fellow undergraduates who are studying mathematical biology. This is a unique opportunity.

#### **What was the *most* useful aspect of the conference? (n=124)**

##### *Student Poster and Oral Presentations (62)*

I liked everything. I believe the talks and the poster sessions are equally important.

The presentations by undergraduates. Gave me a feel for what kind of research they're doing.

Getting experience presenting my research.

Listening to short talks from other students in my age group. I learned a lot not only about their research topics, but also how to give talks about my research in the future.

Poster session

I think the presentations that focused on the environmental issues of the world/U.S. and how to help solve them mathematically were the most useful aspects.

The most useful part was the poster session, I felt that it gave me a time to talk with other students about their work and their research experiences.

The poster session

PI discussion for me. Presentations and posters for the students.

The student presentations. They covered such a wide range of projects and the length was very appropriate.

The opportunity for undergraduate students to present their work in a professional setting.

Presenting my undergraduate research

Letting my students present.

I believe that the large variation of undergraduate research and the presentations regarding the research was important.

Various types of presentations dealing with different aspects of biology and mathematics.

The student presentations and the people who would participate in the question portion was most useful because I was able to expand on the knowledge already presented.

Student presentations.

The presentations and the plenary session

talking to other students about their research at the poster session

I felt the research presentations and the poster session were the most useful aspects of the conference.

undergraduate presentations (oral and poster)

The student presentations

Having the opportunity to see more advanced work being done

UBM=PI meeting and the student presentations

The presentations and the information provided in them and how they were presented.

To see the variety of projects and the enthusiasm of the students involved

While this is a very difficult question, I have to say that the poster session was very enlightening for me. Both because I saw my own work from a new point of view, and because I was able to interact one-on-one with many of the professors that I would otherwise never have a chance to speak with.

#### Undergrad student talks

The experience in presenting scientific research.

Attending the student presentations and learning about the breadth of Biomath research that is being conducted.

talk session about graduate school prospects was useful, but more of the same as every other grad school talk. , The most useful aspect was hearing everyone's research and feeling confident in my own abilities to produce quality research that I can be proud of.

The most useful aspect of the conference was the actual presentation of my research. The opportunity to share my ideas and learn about other research programs and areas of study is what mathematical and scientific research is all about. NIMBioS gives a unique opportunity for undergraduate students to experience what a career in research might feel like.

Having the opportunity to present my work to a large group of people for the first time.

Focus on presentations by undergraduate researchers.

Seeing how other undergrads modeled biological systems, and how they went about analyzing their results.

The opportunity to present my research and learn what other undergraduate students are researching.

Talking experience for the undergrads

#### Student talks

Undergraduate lectures.

Presenting to people like myself. An undergraduate with an interest in the math and sciences. Allowed for connections.

A venue to practice presenting research.

#### Student presentations

The preparation, creating the poster which I presented.

having undergraduate students witness the research work/presentations of other undergraduate students.

The opportunity for students to present their work.

The presentations of the other students in my areas of interest.

Let us know what undergraduate students are performing their research.

an opportunity for students to make presentations

Just listening to other undergrads present their research and seeing what other undergrads in the math biology field are working on.

It gave me experience for what science conferences are like.

I think it was helpful to be able to learn how to present my research.

The presentations and the question and answer sessions. The wildlife presentation and the presentation on modeling fluids were very useful.

Giving students in mathematical biology a venue to present and listen to presentations.

talks and poster session

Poster sessions. Allowing the students to interact with one another.

I liked the presentation given about the wild life park.

Undergraduate presentations both oral and poster were good and enjoyed it.

Scholarly presentations by students and information regarding research facilities and opportunities

Having the students present their work and receive feedback from others

Forum for undergraduates to present to large audience.

motivating examples of student research from across the country

Opportunity for undergrads to present research. Education of the emerging field and opportunities therein.

#### *Good Atmosphere for Student Interactions (24)*

student interactions

Student Involvement

This conference gave EVERY participant an opportunity to share their findings with one another, something that may be difficult to do at a larger conference. Basically, the most useful aspect was the incredible student interaction.

Provided opportunity for students to see other projects.

The presented new ideas, being able to communicate with peers with similar interests and exchange ideas with them.

This was my first opportunity to see complete integration of mathematics and biology in a research setting, which definitely helped me for my future career.

Talking to undergraduates at other universities about their research approach and experience.

The combination panels/presentations/poster session.

undergraduate can present their research and connect with other undergraduates.

Welcoming environment for undergraduates to present their research.

The poster session, I was able to interact with other researchers on a 1 on 1 basis.

Forum for student presentations, poster or oral, in a peer environment

The conference showcase some really excellent research being conducted by undergraduates. I attended the Society for Mathematical Biology meeting this summer in Vancouver and several of the presentations in Knoxville were at least on par with some of the work I saw at SMB. The conference should serve as an inspiration to those who want to develop these sorts of programs. It should also validate their usefulness and effectiveness to the NSF.

Being able to social with others on their projects

Very good forum for undergraduates.

Interaction with other people

The most useful aspect of the conference were the breaks immediately following the students presentation. This was a time we were able to interact directly with the students.

Meeting colleagues from other places.

Meeting different people from around the nation interested in what I'm interested in

Being able to socialize with students and professors from universities all across the country.

For the undergrads, I think the most useful feature is the ability to see a group of peers across the country doing work on Math-Bio. For the faculty, the most useful aspect is the ability to network with potential future grads.

The mix of biologists and mathematicians interacting with each other.

The wide range of areas from which people presented

Communication with students/scientists from other disciplines

*Career Panel Informed Students of Various Careers and Graduate School Info (19)*

the discussion panel was extremely useful

The panel discussion about career opportunities.

The discussion with the review committee. That was VERY informational.

The panel.

The panel discussion about career opportunities for Math/Biology majors

The career panel

The panel discussions on graduate school.

The most useful aspect of the conference was when the panel spoke to the audience.

The most useful part was the panel discussion on career opportunities.

The panel discussions were the most useful aspect of the conference.

The panel discussion

The discussion of careers in the field and other options.

Review panel(QA) and highlights

I was able to see the wide range of possibilities of things that I can study as an undergraduate.

Letting students know that there are career opportunities at the interface of Mathematics and Biology.

I feel that the panel discussion was amazingly useful for undergraduate students.

The panel discussion.

I felt the panel did a really nice job at interpreting what they recognize as important when applying to graduate schools.

panel discussions/presentations

### *Networking Opportunities for Students and Faculty (9)*

Informal connections with other PIs.

Networking for faculty; both networking and a speaking opportunity for students.

The opportunity to meet people who were in the fields you were pursuing, and also the opportunity to meet the people who have funded our research and show them what we had accomplished.

Tie between networking and learning about other research projects.

Networking

Meeting other Math-Bio faculty

time to talk to colleagues and NSF program officers

Networking opportunities with others in my field.

networking

### *PI Meeting for Faculty (3)*

PIs meeting (for me) and student talks and posters (for my students)

the PI meeting, especially Julia's talk. The frank comments at the highlights portion were also gratifying.

PI meeting

### *Food Was Good (2)*

It was beneficial for undergrads., The food at the meeting was great.

food

### *Seeing How UBM Programs are Run (2)*

Finding out about the activities, successes, and challenges of other UBM programs.

Seeing how other UBM programs are run.

### *Miscellaneous (2)*

As a faculty member, I am starting a new inter-disciplinary course "Mathematical Modeling in Biology" for both mathematics and biology students. As this course will be a group project based course, I liked to have some idea of what possible projects that I can go through with my students. In that aspect, this conference was very helpful to me. I strongly support similar conference annually.

I didn't think it really was that useful of a conference

## **What would you change about the conference? (n=103)**

### *More Diverse Career Panel (18)*

better panel discussion, too top heavy from "admin" types, need the students to openly discuss their experiences!!

The panel

The career panel, I don't feel like I really learned about jobs outside of academia that I could possibly do. And also I felt that there was a lot of talk about how to get into grad school (which was helpful) but not really why I would want to go.

Talk more about good graduate schools for mathematics and biology, not just about how to apply for them.

I think we need to give more thought to motivating examples of careers to these students in math/bio



rather than grad school tutorials.

It would be nice if someone can have a seminar or anything that has to do with giving information to students about what they can do after getting their degree. Because not everyone plans to go to graduate school right away. Some of us are looking for jobs and we have nowhere to turn to. So it would be nice if I can get information on what I can do with my degree.

Bring in a "Careers in Math-Biology" panel that had a more diverse work history. The panel was biased in favor of faculty careers.

A career panelist from industry/government (instead of all academics) would have been useful.

I would have people from different career pathways on the career panel

The career panel needed to have representations from a variety of fields. Why not have someone from the NSA or other agencies, USFWS, NASA etc that could inform students about their jobs and the math and bio skills needed for those careers?

The panel discussion.

please include professionals from different sectors of the industry to be on the career guidance panel. You can also include a career fair were companies advertise and offer employment opportunities to students.

It is too heavily focused on ecology. Molecular people are outsiders here.

The career workshop panel should be a little more diverse so that the students will know there are many career options. The panel should also include those careers that are unprecedented but may fit those students who are not interested in academia and/or medicine.

The career panel needs to be just that. Only have mathematicians as leads was not great. There needs to be biology persons as well as people from inside and outside academia.

A more industry-friendly discussion of careers in math-biology. The tenor of the panel discussion left a bad taste in the mouth of students intending to go to medical school or to work in industry, as it came across as though all options that did not include graduate school were less-than-desirable.

The career panel seemed to be missing key people. For example, biotechnology representatives.

Most of the speakers during the panel discussion, were talking about teaching. They omitted some other working opportunities like actuarial science., It would be better if next time different variety of math and biology professionals are invited so that they can touch many different aspects of the different subjects.

*Nothing (17)*

I do not think I would really change anything.

None

Nothing

Nothing really. I enjoyed it.

nothing it was grand

Nothing, it went fine. The distribution of biology topics was ideal.

nothing

Nothing

It was kind of boring.

Nothing

nothing

Nothing! It was great!

Nothing comes to mind.

I don't know.

Nothing.

Honestly, I would change absolutely nothing- Even the food was great! (Perhaps the weather, but alas, that is uncontrollable!)

Nothing

### *More Opportunities for Students to Socialize (13)*

Shorter talks, more opportunities for social networking.

More mingling time

More official time for posters so the students can interact more.

The presentation aspect of the conference was perfect in my opinion. I believe however, that the coordinators should arrange a social event prior to the start of the meeting or give students an opportunity to meet each other and discuss more intimately, what type of research they are carrying out. I believe that this form of "bonding" would allow students to obtain new contacts, as well as new friends.

More social time

maybe some sort of mixer for the students

Try to encourage more interaction among PIs - some sort of introductory "getting to know you" type session. Prior to the PI's meeting, I felt a little isolated.

I would add an undergraduate mixer sort of activity after the poster session. Just point them to a bar/restaurant and let them go out.

I would incorporate more social activities for the students that would provide for the necessary networking opportunities.

Have an informal meeting of PI's sharing their success/failure to others.

More time to converse with the other undergraduates.

I would develop an activity outside of the conference center that would encourage interaction among other researchers.

I think a student mixer would be good. I didn't see as many students taking the opportunity to get to know students from other schools as I would have liked.

### *Change Organization (12)*

Include a proceeding publications to highlight entry into scholarly publications by undergraduates.

Having presentations on all disciplines of biology to give everyone an opportunity to hear something that they interested in pursuing after graduation.

Since our work has just started with the undergraduate students it would have been helpful to hear how other PIs are managing their program in more detail. I would have liked to have a session on that, in particular, what strategies worked on not worked in recruiting, finding projects and managing student work.

Maybe would make sure a broader spectrum of research topics is included, and would include more talks by professors/professional researchers so we may see where this type of research leads to.

The summary at the end was a little confusing and not very helpful.

Have smaller discussion panels regarding careers at the interface of math and biology. It was somewhat difficult to get your questions answered regarding careers.

I would split up the topics more so that you don't have to sit through 3 talks on the same topic but then not have that topic mentioned again.

I would add a social period where participants were encouraged to discuss their projects and to network. (I know that the poster session is also supposed to accomplish this goal...maybe replace 1 hr of the session with one social hour) , I liked the educational talks as well - a series of short presentations from the UBM participants on lessons learned from their individual experiences would also be useful.

As many undergraduate students presented, it would be nice if there is a mini tutorial for a certain related topic at each year.

I would have more presentations by faculty doing fascinating research in a variety of math-bio fields.

Improved printed program (layout, ease of reading). Programming for PIs that is more valuable. A tour of NIMBioS (though I missed Dr. Gross's introduction at the conference - maybe he gave people a 'visual'

walk through with his slides?)

The forums were unorganized and the final one was not very applicable to students (maybe just mention this ahead of time so that students know).

#### *More Time (11)*

- more time to interact outside the presentations sessions, - less presentations or more time for presentations so participants don't miss half of the presentations, - more specific information about people and schools that are into mathematical biology a

More time for poster session.

More time for faculty to discuss teaching and research.

I would continue it through Sat evening and not run the NSF PI discussion session concurrently with the student presentations.

I wouldn't really change anything about it just maybe having some of the presentations run a little longer it seemed like some people didn't get to say everything that they wanted.

More time for group discussion of UBM programs.

Longer

I would change the conference to at three days.

More time to discuss posters

It seemed rushed and many of the presentations were a somewhat too early.

More time in between the presentations.

#### *Changes to Planned Presentations/Talks (7)*

Instead of 2 talks about assessment, maybe one will do.

I did not enjoy the plenary talk. I think she could have done a better job introducing mathematical and computational biology using a case study with specific examples, rather than just glancing over all of the models. Assume a higher level of intellect from the undergraduates!

I would also like to hear a few long talks from PIs or other speakers.

A bit more organization to the talks. i.e. an ecology session, a biophysics session, etc. Might help to sort through and figure out what you want to see

change the plenary talk to the second day because many people fly in the first day and missed it.

Again, I would like to see talks organized topically (I think they somewhat were but this was not

reflected in titled sessions) and a large expansion of the poster space.

Add one or two keynote talks on current research in math or biology that presents the challenges faced by researchers today at the cutting edge. Address this to starting senior level students who might be considering graduate school. Many of the presentations by the students showed a level of sophistication in their work and they could appreciate a challenge to aim for.

#### *Venue (5)*

Have it held in a building with more windows

The room in which the PI's had their first discussion was poorly designed for discussion. The ceiling was too low and the air handlers too noisy to hear each other. Furthermore, the chairs were arranged in a traditional face-the-front formation. Last year's meeting took place in a tiered semi-circular room which was more conducive to a large group discussion. A semi-circle formation in itself would have helped.

location, food

More room for posters. Longer poster sessions. More PI discussions.

Somehow have a venue where people cannot scatter as easily - although the UTK conference center was a very nice environment. It would be nice in some way for different groups to have a bit more time for interaction. More time for posters? , ALSO a participant list would be very useful. I would like to communicate some research suggestions to one group, and an Email address would facilitate this.

#### *Less time (5)*

Increase programming that make people interact across disciplines and institutions., If the conference stays the same size, then put it all on one day. Spreading it out over two was unnecessary waste of UBM program money.

Make it a one day conference, replace oral presentations with all poster sessions, and have some quantitative methods/tools workshops.

The schedule: it could start earlier on Friday, say, at 10 am, with some student talks. Keynote could still be at the start of the afternoon. Then end on Saturday shortly after lunch, to allow people who are flying in to fly out on Saturday afternoon (if they want to).

Not being scheduled so late into Friday evening.

Some of the areas of the poster session were way to cramped for space.

#### *Include an Award for Best Presentation/Poster (4)*

May be start giving a best presentation award. I realize it will be hard to judge given the diversity of presentations, but such an award will be a big motivation for the students to give great presentations. May be another award for the best poster.

I would have liked my presentation or poster to have been judged/critiqued. Ideally I would like to see an awards ceremony for particularly interesting and well-presented research, but if this is not possible, just having a rubric that described what I did right and how I could improve would have been helpful. I know that I have presented my research, and I feel I did it well, but if I made a mistake I would like to know, so that I don't make that same mistake at the next conference I attend.

#### Recognition of outstanding presentations

Offer critiques about one's presentation if he or she wanted. I would have liked to know what I could have improved, changed, etc...

#### *PI Meeting Time Was Inconvenient (3)*

Not having the PI meeting during talks, better retain attendance for afternoon and final presentations.

It was unfair to undergraduate speakers to pull the UBM faculty out of talks for the UBM Conference. I would prefer that the UBM Conference had been later on Saturday or else Sunday morning.

Have the PIs meeting earlier so that connections can be made early and developed over the course of the two days.

#### *Changes to poster session (3)*

move the poster session to a different time; let the students have the evening to interact with one another.

The poster session should be earlier in the day.

Not have the poster session at night.

#### *Miscellaneous (3)*

timing -- over summer rather than during the academic year

If you are going to invite PIs, who have extremely busy schedules, make it worth their while to attend.

The registration process possibly - have it all done in one step (registration, abstracts, titles) because things apparently got lost (my presentation abstract didn't appear in the pamphlet) and it was unclear who the main contact person was.

**Please indicate any changes NIMBioS can make to improve the resources and/or accommodations available to conference participants: (n=28)**

#### *Venue Issues (10)*

One little thing: during the panel discussion, the discussants were seated on the same floor level as the audience. Maybe they could be seated next time on a platform (or in an arrangement where they are easy to see).

Great place actually. It seemed the Keynote type talks were big draws. Having interaction time before or after those might be good., Lobby with snacks and places to sit was inviting.

I would prefer a conference center with more windows! , I felt cold often in this conference center.

The theatre style seating works much better than a normal flat room. It is a lot easier to see in the theatre style rooms.

I thought it was a good setup, but more windows would be nice.

I was cold most of the time. Turn down the air conditioning? Especially on rainy days when many of us ended up with wet feet?

Spread out the posters more.

More room for posters.

The food provided was amazing - the best of any conference I've ever attended. My only complaint was that the exterior of the building was sort of unkempt (the awning on Henley St needs attention) - but this is probably not something you have any control over.

I've been to several conferences and none of them provided us with the amount or quality of food and snacks that this conference provided. I greatly appreciate the constant supply of hot coffee, water, tea, etc. The main change I would have made was that the conference was exceptionally cold. I sometimes found it difficult to concentrate as I tried to conserve body heat. Occasionally I took advantage of the hot water available just to hold onto the cup as a hand-warmer.

### *Excellent (9)*

The administrative/food arrangements were, honestly, the best of any meeting that I have attended. Thank you for taking such good care of us.

Thank you NIMBioS for the great food!!! and accommodations.

I was pleased with the accommodations.

This conference was great. I just hope this wonderful tradition can be continued each year.

No suggestions, excellent work!

These were great!

they did a great job.

NIMBioS is flawless

loved the many sources of caffeine

#### *Food Options (4)*

maybe have more fish options

Not enough vegetarian options for meals.

A healthier option for the snacks would have been nice. But the snacks present were quite tasty!

Stronger coffee would be nice..., Good that breaks are longer than the usual 10-15 minutes

#### *Wireless Access & Other Technical Troubles (3)*

Wireless access.

There were a few glitches with pc's/mac connections that delayed talks. The acoustics in the room for the PI discussion on Saturday afternoon were poor, especially with the a/c running. These are minor issues really - but you asked.

The file on my flash drive wouldn't open and my presentation was moved to a later session, in which session technical difficulties caused a 20-minute delay and many people ended up leaving right before my presentation to attend the panel discussion. I think that problems like these can be avoided if all presentations are preloaded and tested in advance. For example, participants could email their presentations a day or two before the conference.

#### *Travel & Check-in Trouble (1)*

We could not check into the hotel room until in 3:00 pm and we had to present at 4:25 pm. We arrived around 1:00 pm in traveling clothes and could not comfortably change. SO we had to leave the conference around three to change and rush back to the conference center to do our presentation. Maybe something can be arranged to eliminate things like this from happening.

#### **Please provide any additional comments about your overall experience with the conference: (n=41)**

##### *Great, Well-Organized conference (26)*

The conference was well organized. The quality of the student and faculty presentations was high. Overall, the conference was a valuable experience for us.

great experience overall given that it was my first conference experience

Overall, the conference was great. Meeting people was great and I can't wait for next year's meeting.

It was a nice conference.

Overall I was satisfied with the conference and I feel that, for Nimbios' first year, it was fantastic. I believe there were several improvements that could be made for next year, but in general, the entire



experience was quite positive.

Nothing to add

The conference was overall very good. It gave a lot of encouragement to student participants to do research.

It was wonderful. Good job!

It was a wonderful experience and I would not change a thing

I was blown away by all of it. Everyone at NIMBioS was so helpful in providing information.

I really appreciate the conference. I am very much hoping to attend in future years.

I was pleased with this conference and looking forward to the next one. Thanks for all your hard work!

This conference was great. I just hope this wonderful tradition can be continued each year.

Thanks for hosting this!

I really enjoyed it overall conference it was very effective in the way the presentations were set up, and the subjects that the presentations were on based on in the science and math fields were very interesting for future references.

It was great. Thank you!

Thank you so much. It was wonderful and I wish I would have come last year also!

i enjoyed it!!!!

It was a great experience.

It was very insightful

The conference was great! Very well organized and a productive use of time for all participants. Congratulations and thanks to the organizers for all their efforts.

It went very well and I am glad to have participated in this event.

LOVED IT!

Very enjoyable and informative experience

This conference was a fascinating experience for me and is something that I would be honored to be a part of next year! I became introduced to many new and interesting topics and made many new friends! Again, I was truly impressed by this conference; I am looking forward to it next year! Excellent work!

Overall, very satisfied.

*Great Way for Students to Learn About Opportunities in Math and Biology (4)*

The conference was incredibly helpful in creating an environment where students could showcase their research while gaining experience in presenting their research to peers and potential bosses.

It was interesting to learn about what else was going on in the math and biology world.

This conference was a very good experience and opportunity for undergraduates. I guess it would be nice to know what is available (forums/conferences) for graduate students since many of the students that attended this conference will be graduating in the next year or two and starting graduate school. Overall, it was a very nice, smoothly run conference. Thank you!

I thought it was really fun and i got to learn a lot of interesting things. I liked how the research was diverse. I do feel that there was not a lot of bioinformatics and i was a little disappointed because that is what my project focused on. So it seemed that not many people were interested in my poster or project.

#### *Some People Left Too Early (2)*

It was good. One negative was the early departure of many individuals. Those giving later talks were doing so to a reduced audience.

Thought it was interesting how attendance seemed to drop from Friday to Saturday...

#### *Better Information about the conference Ahead of Time (2)*

Advanced information on details of conference were hard to obtain. Early guidance regarding the size of posters, time length of talks, audio visual equipment that would be provided, etc. would be helpful. Confirmation of registration should be send shortly after registration was submitted.

Communication about the conference needs to be better. We found out about it very late, and almost by chance. Part of this relies on better coordination with the NSF program officers. This is understandable as first year teething problems--I'm sure it will get better over the years. All-in-all this is probably valuable to most (especially inexperienced) students who attended. There's not much there for the PIs and faculty, so that could be built more next year.

#### *Miscellaneous (7)*

NIMBioS should host such a conference again, but there should be an aspect of faculty development.

I was very satisfied with the conference. The only issue I had was that they placed the wrong institution next to my name in the schedule. I feel that the programmers should have double checked the schedule before printing them.

Everything went great. Maybe one suggestion: The poster session can be set to take place a little earlier, I believe 9 o'clock it's a little late to leave. Overall, everything was perfect.

Good job, liked the location. If you all could choose a dynamic city for your next conference, that'd be awesome. The city really sets the mood for the entire conference, in my experience.

the chimes to re-start sessions are very nice!

I found it to be a very useful networking tool and I enjoyed listening to the research that my fellow undergraduate students were participating in.

I enjoyed listening to other students' research in biology and mathematics, however the focus of the panel discussion solely on graduate school was not helpful to me other than confirming that I definitely want to go to Medical school.