Supplemental Material

CBE—Life Sciences Education

Gin et al.

Supplemental Material for

An exploration across institution types of undergraduate life sciences student decisions to stay in or leave an academic-year research experience

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This supplement contains the following:

Copy of survey questions analyzed

1. Have you, currently or in the past, participated in a scientific undergraduate research experience while enrolled in college? For example, conducting research with a faculty member or in a faculty member's lab.
   - o   Yes
   - o   No *[Students are directed to the end of the survey]*

2. Have you only participated in a summer research experience (e.g., REU) that you did not participate in during the school year?
   - o   Yes *[Students are directed to the end of the survey]*
   - o   No

We are trying to learn more about undergraduate students' experiences in research during the academic school year. During this survey, we would like you to consider your undergraduate research experience. If you have participated in more than one undergraduate research experience, please consider your **FIRST undergraduate research experience** that took place during the academic year when answering the following questions.

4. Have you or did you ever **consider leaving** your **first undergraduate research experience** before graduating from college?
   - o   Yes *[Students are directed to question 5]*
   - o   No *[Students are directed to questions 8 and 9]*

5. Did you **actually leave** your **first undergraduate research experience** before graduating from college?
   - o   Yes, I was asked to leave my research experience *[Students are directed to question 7]*
   - o   Yes, I chose to leave my research experience *[Students are directed to questions 6 then 10]*
   - o   No, I did not leave my research experience *[Students are directed to question 6 then 8]*

6. Please explain **why you considered leaving** your first research experience. Please be as detailed as possible in your response. *[Students are directed to question 8 or 10 based on response to question 5]*

7. Why were you asked to leave your undergraduate research experience? Please be as detailed as possible in your response. *[Students are directed to demographic questions]*

8. Please explain **why you chose to stay** in your first research experience. Please be as detailed as possible in your response.

9. Which of the following aspects of your research experience made you **want to stay** in your first research experience? Please select all that apply. If none apply, please go on to the next question.
- o Research experience is important for my future career
- o Doing research positively contributes to my financial situation
- o I have enough time to do research
- o I am concerned I may not have another research opportunity
- o My mentor who is a PI/faculty member/grad student/post-doc/staff member
- o The overall environment of my lab
- o The lab is flexible with my schedule/time
- o I have sufficient guidance for my research project
- o I enjoy my everyday research tasks
- o I am interested in my research topic
- o I am gaining important skills and knowledge

10. Which of the following aspects of your research experience made you **consider leaving** your first research experience? Please select all that apply. If none apply, please go on to the next question.
- o Research experience is not/was not important for my future career
- o I need/needed to spend my time making more money than I make/was making doing research
- o I do not/did not have enough time to do research
- o I am interested/was interested in another research opportunity
- o My mentor who is a PI/faculty member/grad student/post-doc/staff member
- o The overall environment of my lab
- o The lab is not/was not flexible with my schedule/time
- o I do not/did not have sufficient guidance for my research project
- o I do not/did not enjoy my everyday research tasks
- o I am not/was not interested in my research topic
- o I am not/was not gaining important skills and knowledge

Demographic questions about research and students
11. Please indicate who you work/worked with most closely during your first undergraduate research experience.
- o PI (Principal Investigator)/faculty member
- o A graduate student
- o A post-doc
- o A staff member (e.g. lab coordinator, lab manager)
- o Other, please describe

12. Please choose the response that most accurately describes how you are/were compensated for your time working on undergraduate research. **Choose all that apply.**
- o I receive/received course credit for my time participating in undergraduate research

o   I receive/received money for my time participating in undergraduate research (e.g., wage, stipend)
o   I volunteer/volunteered my time in undergraduate research (do not/did not receive credit or money)

13. On average, how many hours per week do/did you spend working on undergraduate research (inside and outside the lab)?
- 1-5 hours
- 6-10 hours
- 11-15 hours
- 16 hours or more
- Decline to state

14. What is your grade point average (GPA)?

15. I most closely identify as
o   Woman
o   Man
o   Other (please describe)
o   Decline to state

16. I most closely identify as
o   First-generation college student whose parents' highest level of education is a high school diploma or less
o   First-generation college student (at least one parent has some college)
o   Non-first generation college student (at least one parent has finished college)
o   Decline to state

17. I most closely identify as
o   American Indian or Alaska Native
o   Asian
o   Black or African American
o   Hispanic, Latinx, or Spanish Origin
o   Pacific Islander
o   White/Caucasian
o   Other (please describe)
o   Decline to state

Table S1. Students included in final dataset by institution type and geographic region

R1 Public Universities	n = 760 % (n)
R1 Public University #1 (Southwest)	18.2% (138)
R1 Public University #2 (Northeast)	13.6% (103)
R1 Public University #3 (Southwest)	10.7% (81)
R1 Public University #4 (Southwest)	9.5% (72)
R1 Public University #5 (Midwest)	6.2% (47)
R1 Public University #6 (Midwest)	5.5% (42)
R1 Public University #7 (Midwest)	5.1% (39)
R1 Public University #8 (Southeast)	5.1% (39)
R1 Public University #9 (Northwest)	3.0% (23)
R1 Public University #10 (Northeast)	2.9% (22)
R1 Public University #11 (Southeast)	2.6% (20)
R1 Public University #12 (Southeast)	2.6% (20)
R1 Public University #13 (Midwest)	2.2% (17)
R1 Public University #14 (Southeast)	2.0% (15)
R1 Public University #15 (Southwest)	1.7% (13)
R1 Public University #16 (Northeast)	1.6% (12)
R1 Public University #17 (Midwest)	1.4% (11)
R1 Public University #18 (Northeast)	1.3% (10)
R1 Public University #19 (Northwest)	1.3% (10)
R1 Public University #20 (Southwest)	1.2% (9)
R1 Public University #21 (Southeast)	0.8% (6)
R1 Public University #22 (Midwest)	0.5% (4)
R1 Public University #23 (Midwest)	0.5% (4)
R1 Public University #24 (Northwest)	0.3% (2)
R1 Public University #25 (Southeast)	0.1% (1)
R1 Private Universities	**n = 248 % (n)**
R1 Private University #1 (Midwest)	25.4% (63)
R1 Private University #2 (Northeast)	19.4% (48)
R1 Private University #3 (Northeast)	12.5% (31)
R1 Private University #4 (Northeast)	12.1% (30)
R1 Private University #5 (Northeast)	6.5% (16)
R1 Private University #6 (Southeast)	6.0% (15)
R1 Private University #7 (Northeast)	6.0% (15)
R1 Private University #8 (Northeast)	4.0% (10)
R1 Private University #9 (Northeast)	3.2% (8)
R1 Private University #10 (Northeast)	2.0% (5)
R1 Private University #11 (Southeast)	1.6% (4)
R1 Private University #12 (Southeast)	0.8% (2)
Master's-granting Institutions	**n = 150 % (n)**
Master's-granting Institution #1 (Northwest)	11.3% (17)
Master's-granting Institution #2 (Northeast)	9.3% (14)
Master's-granting Institution #3 (Midwest)	8.0% (12)
Master's-granting Institution #4 (Northeast)	6.7% (10)

Master's-granting Institution #5 (Southeast)	6.7% (10)
Master's-granting Institution #6 (Midwest)	6.0% (9)
Master's-granting Institution #7 (Midwest)	5.3% (8)
Master's-granting Institution #8 (Northeast)	5.3% (8)
Master's-granting Institution #9 (Midwest)	4.7% (7)
Master's-granting Institution #10 (Southeast)	4.0% (6)
Master's-granting Institution #11 (Southeast)	4.0% (6)
Master's-granting Institution #12 (Northeast)	3.3% (5)
Master's-granting Institution #13 (Southwest)	3.3% (5)
Master's-granting Institution #14 (Southeast)	2.7% (4)
Master's-granting Institution #15 (Southeast)	2.7% (4)
Master's-granting Institution #16 (Midwest)	2.7% (4)
Master's-granting Institution #17 (Southeast)	2.0% (3)
Master's-granting Institution #18 (Midwest)	1.3% (2)
Master's-granting Institution #19 (Southwest)	1.3% (2)
Master's-granting Institution #20 (Northeast)	1.3% (2)
Master's-granting Institution #21 (Northeast)	1.3% (2)
Master's-granting Institution #22 (Midwest)	1.3% (2)
Master's-granting Institution #23 (Southeast)	0.6% (1)
Master's-granting Institution #24 (Southeast)	0.6% (1)
Master's-granting Institution #25 (Southeast)	0.6% (1)
Master's-granting Institution #26 (Midwest)	0.6% (1)
Master's-granting Institution #27 (Northeast)	0.6% (1)
Master's-granting Institution #28 (Northeast)	0.6% (1)
Master's-granting Institution #29 (Northeast)	0.6% (1)
Master's-granting Institution #30 (Southwest)	0.6% (1)
Primarily Undergraduate Institutions	**n = 104 % (n)**
Primarily Undergraduate Institution #1 (Midwest)	18.3% (19)
Primarily Undergraduate Institution #2 (Northeast)	13.5% (14)
Primarily Undergraduate Institution #3 (Southeast)	8.7% (9)
Primarily Undergraduate Institution #4 (Northwest)	7.7% (8)
Primarily Undergraduate Institution #5 (Midwest)	7.7% (8)
Primarily Undergraduate Institution #6 (Northeast)	7.7% (8)
Primarily Undergraduate Institution #7 (Northeast)	5.8% (6)
Primarily Undergraduate Institution #8 (Northeast)	4.8% (5)
Primarily Undergraduate Institution #9 (Southeast)	4.8% (5)
Primarily Undergraduate Institution #10 (Southeast)	3.8% (4)
Primarily Undergraduate Institution #11 (Southwest)	2.9% (3)
Primarily Undergraduate Institution #12 (Southeast)	1.9% (2)
Primarily Undergraduate Institution #13 (Midwest)	1.9% (2)
Primarily Undergraduate Institution #14 (Midwest)	1.9% (2)
Primarily Undergraduate Institution #15 (Northeast)	1.9% (2)
Primarily Undergraduate Institution #16 (Midwest)	1.9% (2)
Primarily Undergraduate Institution #17 (Midwest	1.9% (2)
Primarily Undergraduate Institution #18 (Midwest)	1.0% (1)
Primarily Undergraduate Institution #19 (Southeast)	1.0% (1)
Primarily Undergraduate Institution #20 (Midwest)	1.0% (1)

Table S2. Results of multinomial logistic regression testing to what extent institution type and student demographics predict whether a student considers leaving (waverer) or actually leaves their research experience (leaver) compared to choosing to stay (stayer).

Variable	Waverer (stayer)					Leaver (stayer)				
	B	SE B	β	*p*	Odds ratio	B	SE B	β	*p*	Odds ratio
(Intercept)	-1.54	0.84	1.82	0.07	NA	-2.74	0.84	3.26	**0.001**	NA
Institution type ***(Public R1)***										
Private R1	0.13	0.20	0.66	0.51	1.14	0.08	0.19	0.40	0.69	1.08
Master's	-1.02	0.27	3.68	**<0.001**	2.78	-1.50	0.31	4.80	**<0.001**	4.48
PUI	-0.90	0.32	2.79	**0.005**	2.46	-1.03	0.32	3.23	**0.001**	2.82
Gender (man)										
Woman	0.37	0.19	1.95	**0.05**	1.45	0.35	0.18	1.92	0.06	1.41
Race (white)										
Asian	-0.23	0.20	1.16	0.25	1.25	-0.06	0.18	0.30	0.76	1.06
BLNP	-0.47	0.28	1.77	0.08	1.60	-0.14	0.24	0.57	0.57	1.14
Generation status ***(non-first gen)***										
First-generation	-0.16	0.19	0.84	0.40	1.17	-0.01	0.18	0.05	0.96	1.01
GPA	0.18	0.22	0.78	0.43	1.01	0.53	0.22	2.39	**0.02**	1.71

B represents unstandardized coefficients and β represents standardized coefficients.
Reference groups are in parentheses.
BLNP: Black or African American, Hispanic, Latinx or of Spanish Origin, American Indian or Alaska Native and Pacific Islander

Table S3.1-11. Results of logistic regression testing to what extent institution type and student demographics predict whether a student checks a particular reason for why they considered leaving their first URE. Bolded numbers indicate significant differences (p < 0.05).

Table S3.1. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**I did not enjoy my everyday research tasks**" as a reason for considering leaving their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	-3.15 ± 1.06	-2.96	0.003	NA
Institution type (Public R1)				
Private R1	0.03 ± 0.22	0.12	0.90	1.03
Master's-granting	-0.67 ± 0.43	-1.55	0.12	1.95
PUI	-0.47 ± 0.45	-1.04	0.30	1.59
Gender (man)				
Woman	-0.16 ± 0.23	-0.72	0.47	1.18
Race (white)				
Asian	0.47 ± 0.22	2.14	**0.03**	1.61
BLNP	0.67 ± 0.31	2.15	**0.03**	1.96
Generation status (non-first gen)				
First-generation college student	-0.14 ± 0.23	-0.61	0.54	1.15
GPA	0.79 ± 0.28	2.78	**0.005**	2.19

Table S3.2. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**I was interested in another research opportunity**" as a reason for considering leaving their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	-1.90 ± 1.03	-1.84	0.07	NA
Institution type (Public R1)				
Private R1	0.13 ± 0.22	0.59	0.55	1.14
Master's-granting	-0.85 ± 0.45	-1.89	0.06	2.33
PUI	-0.20 ± 0.43	-0.46	0.64	1.22
Gender (man)				
Woman	0.07 ± 0.23	0.30	0.76	1.07
Race (white)				
Asian	-0.02 ± 0.22	-0.09	0.93	1.02
BLNP	-0.07 ± 0.32	-0.21	0.83	1.07
Generation status (non-first gen)				
First-generation college student	-0.38 ± 0.23	-1.67	0.09	1.47
GPA	0.44 ± 0.28	1.61	0.11	1.56

Table S3.3. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**I did not have enough time to do research**" as a reason for considering leaving their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	1.76 ± 0.98	1.79	0.07	NA
Institution type (Public R1)				
Private R1	-0.08 ± 0.23	-0.37	0.71	1.09
Master's-granting	0.22 ± 0.38	0.58	0.56	1.25
PUI	0.01 ± 0.43	0.02	0.99	1.01
Gender (man)				
Woman	0.15 ± 0.23	0.64	0.52	1.16
Race (white)				
Asian	-0.06 ± 0.23	-0.26	0.80	1.06
BLNP	-0.65 ± 0.33	-1.94	**0.05**	1.91
Generation status (non-first gen)				
First-generation college student	-0.16 ± 0.23	-0.68	0.50	1.17
GPA	-0.62 ± 0.26	-2.38	**0.02**	1.86

Table S3.4. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**I did not have sufficient guidance for my research project**" as a reason for considering leaving their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	-0.99 ± 1.06	-0.94	0.35	NA
Institution type (Public R1)				
Private R1	-0.17 ± 0.24	-0.69	0.49	1.18
Master's-granting	-0.12 ± 0.42	-0.29	0.77	1.13
PUI	-0.28 ± 0.46	-0.60	0.55	1.32
Gender (man)				
Woman	-0.04 ± 0.24	-0.15	0.88	1.04
Race (white)				
Asian	-0.28 ± 0.24	-1.14	0.25	1.32
BLNP	-0.17 ± 0.34	-0.51	0.61	1.19
Generation status (non-first gen)				
First-generation college student	-0.17 ± 0.24	-0.71	0.48	1.19
GPA	0.10 ± 0.28	0.35	0.73	1.10

Table S3.5. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**My mentor who is a PI, faculty member, postdoc, graduate student, or staff member**" as a reason for considering leaving their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	-1.72 ± 1.11	-1.55	0.12	NA

Model	B ± SE	z value	p-value	Odds ratio
Institution type (Public R1)				
Private R1	-0.10 ± 0.24	-0.43	0.67	1.11
Master's-granting	-0.19 ± 0.43	-0.45	0.65	1.21
PUI	0.00 ± 0.45	0.002	1.00	1.00
Gender (man)				
Woman	-0.10 ± 0.24	-0.43	0.67	1.11
Race (white)				
Asian	-0.08 ± 0.24	-0.34	0.74	1.08
BLNP	-0.65 ± 0.38	-1.70	0.09	1.91
Generation status (non-first gen)				
First-generation college student	0.02 ± 0.24	0.10	0.92	1.02
GPA	0.28 ± 0.30	0.96	0.34	1.33

Table S3.6. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**I was not interested in my research topic**" as a reason for considering leaving their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	-2.87 ± 1.14	-2.52	0.01	NA
Institution type (Public R1)				
Private R1	-0.04 ± 0.24	-0.15	0.88	1.04
Master's-granting	-0.05 ± 0.43	-0.11	0.91	1.05
PUI	0.08 ± 0.45	0.18	0.86	1.08
Gender (man)				
Woman	0.22 ± 0.26	0.86	0.39	1.25
Race (white)				
Asian	0.18 ± 0.24	0.76	0.45	1.20
BLNP	0.39 ± 0.33	1.18	0.24	1.47
Generation status (non-first gen)				
First-generation college student	-0.19 ± 0.25	-0.78	0.44	1.21
GPA	0.48 ± 0.30	1.60	0.11	1.62

Table S3.7. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**The overall environment of my lab**" as a reason for considering leaving their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	-0.66 ± 1.06	-0.62	0.53	NA
Institution type (Public R1)				
Private R1	0.32 ± 0.23	1.37	0.17	1.38
Master's-granting	-0.70 ± 0.51	-1.37	0.17	2.01
PUI	-0.14 ± 0.49	-0.29	0.77	1.15
Gender (man)				
Woman	-0.45 ± 0.24	-1.86	0.06	1.57
Race (white)				
Asian	-0.04 ± 0.25	-0.17	0.86	1.04
BLNP	0.08 ± 0.34	0.23	0.82	1.08

	B ± SE	z value	p-value	Odds ratio
Generation status (non-first gen)				
First-generation college student	0.10 ± 0.24	0.40	0.69	1.10
GPA	-0.003 ± 0.28	-0.01	0.99	1.00

Table S3.8. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**I needed to spend time making more money that I made doing research**" as a reason for considering leaving their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	0.24 ± 1.06	0.22	0.82	NA
Institution type (Public R1)				
Private R1	-0.55 ± 0.28	-1.98	**0.05**	1.73
Master's-granting	-0.001 ± 0.42	-0.003	1.00	1.00
PUI	-0.79 ± 0.56	-1.40	0.16	2.20
Gender (man)				
Woman	0.05 ± 0.26	0.20	0.85	1.05
Race (white)				
Asian	-0.65 ± 0.28	-2.30	**0.02**	1.91
BLNP	-0.44 ± 0.36	-1.21	0.22	1.55
Generation status (non-first gen)				
First-generation college student	0.43 ± 0.25	1.73	0.08	1.53
GPA	-0.34 ± 0.28	-1.20	0.23	1.40

Table S3.9. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**I was not gaining important skills or knowledge**" as a reason for considering leaving their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	-1.97 ± 1.19	-1.19	0.10	NA
Institution type (Public R1)				
Private R1	0.62 ± 0.25	2.47	**0.01**	1.85
Master's-granting	-0.68 ± 0.63	-1.08	0.28	2.00
PUI	-0.93 ± 0.75	-1.24	0.22	2.54
Gender (man)				
Woman	0.30 ± 0.30	1.01	0.31	1.35
Race (white)				
Asian	0.43 ± 0.27	1.61	0.11	1.53
BLNP	0.62 ± 0.35	1.76	0.08	1.85
Generation status (non-first gen)				
First-generation college student	0.02 ± 0.27	0.08	0.94	1.02
GPA	0.02 ± 0.31	0.05	0.96	1.02

Table S3.10. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**The lab was not flexible with my schedule/time**" as a reason for considering leaving their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	-0.36 ± 1.32	-0.27	0.79	NA
Institution type (Public R1)				
Private R1	0.67 ± 0.30	2.25	**0.02**	1.95
Master's-granting	0.20 ± 0.57	0.34	0.73	1.22
PUI	0.37 ± 0.58	0.64	0.53	1.45
Gender (man)				
Woman	1.09 ± 0.45	2.44	**0.01**	2.98
Race (white)				
Asian	0.26 ± .0.32	0.80	0.42	1.29
BLNP	-0.24 ± 0.47	-0.52	0.60	1.28
Generation status (non-first gen)				
First-generation college student	-0.47 ± 0.35	-1.32	0.19	1.60
GPA	-0.72 ± 0.34	-2.10	**0.04**	2.05

Table S3.11. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**Research experience was not important for my future career**" as a reason for considering leaving their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	-4.29 ± 1.65	-2.60	0.01	NA
Institution type (Public R1)				
Private R1	-0.27 ± 0.35	-0.78	0.44	1.31
Master's-granting	0.19 ± 0.57	0.34	0.74	1.21
PUI	-1.28 ± 1.04	-1.23	0.22	3.59
Gender (man)				
Woman	0.61 ± 0.40	1.51	0.13	1.84
Race (white)				
Asian	0.39 ± 0.32	1.20	0.23	1.48
BLNP	0.28 ± 0.46	0.61	0.54	1.32
Generation status (non-first gen)				
First-generation college student	-0.09 ± 0.35	-0.27	0.79	1.10
GPA	0.47 ± 0.43	1.09	0.28	1.60

Table S4.1-11. Results of logistic regression testing to what extent institution type and student demographics predict whether a student checks a particular reason for staying in their first URE. Bolded numbers indicate significant differences (p < 0.05).

Table S4.1. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**Research experience is important for my future career**" as a reason for staying in their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	3.03 ± 1.03	2.94	**0.003**	NA
Institution type (Public R1)				
Private R1	0.03 ± 0.26	0.13	0.90	1.03
Master's-granting	-0.31 ± 0.27	-1.14	0.25	1.36
PUI	0.16 ± 0.37	0.43	0.67	1.17
Gender (man)				
Woman	-0.38 ± 0.24	-1.60	0.11	1.46
Race (white)				
Asian	-0.18 ± 0.23	-0.76	0.45	1.20
BLNP	-0.07 ± 0.31	-0.22	0.83	1.07
Generation status (non-first gen)				
First-generation college student	-0.41 ± 0.21	-1.92	**0.05**	1.50
GPA	-0.24 ± 0.27	-0.90	0.37	1.28

Table S4.2. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**I am gaining important skills or knowledge**" as a reason for staying in their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	1.55 ± 0.98	1.58	0.11	NA
Institution type (Public R1)				
Private R1	-0.33 ± 0.25	-1.30	0.19	1.38
Master's-granting	-0.16 ± 0.29	-0.57	0.57	1.18
PUI	0.03 ± 0.37	0.09	0.93	1.03
Gender (man)				
Woman	0.08 ± 0.22	0.34	0.74	1.08
Race (white)				
Asian	-0.23 ± 0.24	-0.98	0.33	1.26
BLNP	-0.46 ± 0.29	-1.60	0.11	1.58
Generation status (non-first gen)				
First-generation college student	-0.45 ± 0.21	-2.11	**0.04**	1.57
GPA	0.12 ± 0.26	0.48	0.63	1.13

Table S4.3. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**The lab is flexible with my schedule/time**" as a reason for staying in their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	1.54 ± 0.91	1.69	0.09	NA
Institution type (Public R1)				
Private R1	-0.45 ± 0.22	-2.03	**0.04**	1.57
Master's-granting	-0.59 ± 0.25	-2.39	**0.02**	1.81
PUI	-0.57 ± 0.29	-1.96	**0.05**	1.77
Gender (man)				
Woman	-0.27 ± 0.21	-1.30	0.19	1.31
Race (white)				
Asian	-0.37 ± 0.21	-1.74	0.08	1.45
BLNP	-0.36 ± 0.27	-1.34	0.18	1.44
Generation status (non-first gen)				
First-generation college student	0.19 ± 0.21	0.93	0.35	1.21
GPA	0.09 ± 0.24	0.38	0.70	1.10

Table S4.4. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**My lab mentor who is a PI, faculty member, graduate students, postdoc, or staff member**" as a reason for staying in their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	-0.77 ± 0.85	-0.91	0.37	NA
Institution type (Public R1)				
Private R1	0.03 ± 0.23	0.13	0.90	1.03
Master's-granting	-0.21 ± 0.25	-0.85	0.40	1.23
PUI	-0.28 ± 0.29	-0.99	0.32	1.33
Gender (man)				
Woman	0.01 ± 0.20	0.06	0.95	1.01
Race (white)				
Asian	-0.25 ± 0.21	-1.21	0.23	1.29
BLNP	-0.40 ± 0.26	-1.56	0.12	1.49
Generation status (non-first gen)				
First-generation college student	0.15 ± 0.20	0.76	0.45	1.16
GPA	0.60 ± 0.23	2.64	**0.008**	1.82

Table S4.5. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**I am interested in my research topic**" as a reason for staying in their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	-0.06 ± 0.83	-0.07	0.94	NA
Institution type (Public R1)				

	B ± SE	z value	p-value	Odds ratio
Private R1	0.21 ± 0.22	0.95	0.34	1.23
Master's-granting	0.15 ± 0.25	0.62	0.54	1.16
PUI	0.21 ± 0.30	0.70	0.49	1.23
Gender (man)				
Woman	-0.16 ± 0.19	-0.82	0.41	1.17
Race (white)				
Asian	-0.13 ± 0.20	-0.63	0.53	1.14
BLNP	-0.05 ± 0.26	-0.20	0.85	1.05
Generation status (non-first gen)				
First-generation college student	0.03 ± 0.19	0.17	0.86	1.03
GPA	0.35 ± 0.22	1.59	0.11	1.42

Table S4.6. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**The overall environment of my lab**" as a reason for staying in their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	0.44 ± 0.78	0.56	0.58	NA
Institution type (Public R1)				
Private R1	0.30 ± 0.21	1.44	0.15	1.36
Master's-granting	-0.43 ± 0.21	-1.99	**0.05**	1.53
PUI	-0.30 ± 0.26	-1.16	0.25	1.35
Gender (man)				
Woman	-0.31 ± 0.18	-1.72	0.09	1.36
Race (white)				
Asian	0.30 ± 0.20	1.52	0.13	1.34
BLNP	0.03 ± 0.24	0.11	0.91	1.03
Generation status (non-first gen)				
First-generation college student	-0.06 ± 0.17	-0.36	0.72	1.06
GPA	0.15 ± 0.21	0.71	0.47	1.16

Table S4.7. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**I enjoy my everyday research tasks**" as a reason for staying in their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	0.92 ± 0.75	1.22	0.22	NA
Institution type (Public R1)				
Private R1	-0.35 ± 0.19	-1.85	0.06	1.42
Master's-granting	-0.08 ± 0.21	-0.39	0.70	1.09
PUI	0.19 ± 0.26	0.74	0.46	1.21
Gender (man)				
Woman	-0.19 ± 0.17	-1.13	0.26	1.21
Race (white)				
Asian	-0.15 ± 0.18	-0.85	0.40	1.16
BLNP	-0.57 ± 0.23	-2.49	**0.01**	1.76
Generation status (non-first gen)				

Model	B ± SE	z value	p-value	Odds ratio
First-generation college student	-0.05 ± 0.16	-0.33	0.74	1.06
GPA	-0.09 ± 0.20	-0.45	0.65	1.09

Table S4.8. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**I have sufficient guidance for my research project**" as a reason for staying in their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	-1.40 ± 0.76	-1.86	0.06	NA
Institution type (Public R1)				
Private R1	-0.07 ± 0.19	-0.36	0.72	1.07
Master's-granting	0.18 ± 0.21	0.88	0.38	1.20
PUI	0.40 ± 0.25	1.59	0.11	1.49
Gender (man)				
Woman	-0.05 ± 0.16	-0.32	0.75	1.05
Race (white)				
Asian	-0.02 ± 0.17	-0.12	0.90	1.02
BLNP	-0.29 ± 0.23	-1.26	0.21	1.34
Generation status (non-first gen)				
First-generation college student	-0.01 ± 0.16	-0.05	0.96	1.01
GPA	0.40 ± 0.20	1.97	**0.05**	1.49

Table S4.9. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**I have enough time to do research**" as a reason for staying in their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	-0.82 ± 0.77	-1.07	0.28	NA
Institution type (Public R1)				
Private R1	-0.27 ± 0.19	-1.41	0.16	1.31
Master's-granting	-0.46 ± 0.22	-2.06	**0.04**	1.58
PUI	-0.11 ± 0.25	-0.43	0.67	1.11
Gender (man)				
Woman	-0.32 ± 0.16	-1.98	**0.05**	1.38
Race (white)				
Asian	0.31 ± 0.18	1.73	0.08	1.36
BLNP	0.05 ± 0.23	0.20	0.84	1.05
Generation status (non-first gen)				
First-generation college student	0.06 ± 0.17	0.37	0.71	1.06
GPA	0.19 ± 0.20	0.93	0.35	1.21

Table S4.10. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**I am concerned I may not have another opportunity**" as a reason for staying in their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio

Model	B ± SE	z value	p-value	Odds ratio
Intercept	0.69 ± 0.84	0.82	0.42	NA
Institution type (Public R1)				
Private R1	-0.09 ± 0.22	-0.41	0.68	1.09
Master's-granting	-0.42 ± 0.27	-1.60	0.11	1.53
PUI	-0.49 ± 0.33	-1.52	0.13	1.64
Gender (man)				
Woman	0.22 ± 0.20	1.14	0.26	1.25
Race (white)				
Asian	0.59 ± 0.19	3.02	**0.003**	1.80
BLNP	0.08 ± 0.26	0.32	0.75	1.09
Generation status (non-first gen)				
First-generation college student	0.04 ± 0.19	0.21	0.84	1.04
GPA	-0.58 ± 0.22	-2.57	**0.01**	1.78

Table S4.11. Results table for logistic regression testing to what extent institution type and student demographics predict whether a student checks "**Doing research positively contributes to my financial situation**" as a reason for staying in their first undergraduate research experience.

Model	B ± SE	z value	p-value	Odds ratio
Intercept	0.15 ± 0.94	0.16	0.87	NA
Institution type (Public R1)				
Private R1	0.30 ± 0.24	1.23	0.22	1.34
Master's-granting	-0.65 ± 0.32	-2.05	**0.04**	1.91
PUI	-0.19 ± 0.34	-0.56	0.58	1.21
Gender (man)				
Woman	-0.22 ± 0.21	-1.06	0.29	1.25
Race (white)				
Asian	-0.68 ± 0.26	-2.64	**0.008**	1.98
BLNP	-0.45 ± 0.31	-1.47	0.14	1.57
Generation status (non-first gen)				
First-generation college student	0.34 ± 0.21	1.60	0.11	1.41
GPA	-0.41 ± 0.25	-1.63	0.10	1.51

Table S5. Student responses to the open-ended question about why they considered leaving their first URE. Codes that were reported by >5% of students are included.

Reasons why students considered leaving their research experience	Description	All students	Students who left (leavers)		Students who considered leaving but stayed (waverers)	
		% (n) n=572	% (n) n=307	Student Quote (Institution Type)	% (n) n=265	Student Quote (Institution Type)
Broadly disinterested in/does not enjoy research	Student considered leaving or left research because they did not enjoy the research topic, the topic is not of interest to them, or they find the research boring. The student may also describe that the research doesn't align with their major or academic interests.	17.0% (97)	15.6% (48)	"I chose to leave because the work I was given was boring." (Private R1)	18.5% (49)	"I am not enjoying the topic of research as much as I originally anticipated." (PUI)
Personal time constraints	Student considered leaving or left research because working in the lab interferes with their personal commitments, such as academics or time in their personal schedule.	16.1% (92)	11.1% (34)	"I was busy. I needed time to prepare for the graduate school exam." (Private R1)	21.9% (58)	"I was planning on volunteering at other places and taking more classes so I was not sure if I would have enough time to do research as well." (Public R1)
Insufficient guidance and/or absent mentor	Student considered leaving or left research because their mentor is absent or that they do not have sufficient guidance for their research.	11.9% (68)	13.4% (41)	"The PI was very rarely in the actual lab and it was very hard to have to meetings with her." (Public R1)	10.2% (27)	"The professor that was supposed to help us with the research wasn't particularly helpful and left us to do most things by ourselves without having him there to show us how to do things." (Private R1)
Negative lab environment	Student considered leaving or left their research experience because of a negative lab environment or because they have a negative relationship with others in the lab besides their mentor.	10.5% (60)	12.7% (39)	"The overall culture of the lab wasn't very inviting." (Public R1)	7.9% (21)	"The lab environment was toxic for a period of time." (Master's)

Negative PI/mentor relationship	Student considered leaving or left their research experience because they have a negative relationship with their mentor. A student's PI or anyone whom the student indicated they worked for is considered their mentor.	9.1% (52)	12.1% (37)	"[My mentor] discriminated against my lab partner, firing her because he thought she had an attention disorder (she has never been tested nor has felt the need to be)." (Master's)	5.7% (15)	"My supervisor is also not the kindest to the assistants and clearly shows favoritism." (Public R1)
Intention to seek a different research opportunity	Student considered leaving or left research to seek or explore another research lab or opportunity, but have not explicitly stated that they have transitioned to a different opportunity.	8.9% (51)	5.9% (18)	"I left because I there is another experience more suited to my interests." (Private R1)	12.5% (33)	"I considered leaving to find a lab that aligned more with what I am interested in." (Private R1)
High time commitment	Student considered leaving or left their research experience because the research requires a lot of time or too much time.	8.4% (48)	9.1% (28)	"I was asked to volunteer 13-15 hours a week (not being paid or receiving credit), and was spending all of my time at the lab when I was not in class." (Master's)	7.5% (20)	"I considered leaving because it was a large time commitment." (PUI)
Lack of intellectual contribution to project	Student considered leaving or left their research because they do not feel like they are contributing intellectually to a project or participating in meaningful discussions. Additionally, students can describe that the tasks that they are doing are menial or not important to advancing the research project.	6.1% (35)	6.2% (19)	"I was not contributing to the studies of the lab in any significant way and I was not learning anything." (Private R1)	6.0% (16)	"I was not given a project of my own and I did not feel like I was able to contribute in a meaningful way." (Public R1)
Work is tedious or monotonous	Student considered leaving or left their research because they felt the lab work they are doing is boring, repetitive, tedious, or monotonous. Additionally, a student could describe their work as not challenging enough or that they would rather be doing something else.	5.9% (34)	5.5% (17)	"I had been doing lower-level lab tasks (running PCRs, counting pollen grains, etc.) in an evolutionary biology lab. I loved the work that I did as the manager of the experimental plants (like 1400 specimen) but the lab work was tedious." (Private R1)	6.4% (17)	"I also found lab work tedious and boring." (Private R1)

Lack of personal growth or benefit	Student considered leaving or left their research because their lab did not offer opportunities for advancement in lab tasks, promotion, and responsibilities. Additionally, a student can describe that they did not feel they were growing as a scientist.	5.9% (34)	7.2% (22)	"The work that I was doing gave no research experience, it was administering food to rabbits. These skills were not translatable to anything my career includes." (PUI)	4.5% (12)	"I felt I wasn't achieving the goals I set out to when I entered the lab." (Public R1)
More interested in another area	Student considered leaving or left their research because they find another area of research more interesting than what they are doing.	5.6% (32)	6.2% (19)	"I left the first lab because there was another research opportunity that was more relevant to my interests." (Public R1)	4.9% (13)	"The research was involved in molecular ecology of butterflies, I am more interested in marine ecology." (Master's)
Found different/better research opportunity	Student considered leaving or left their research because they have found, transitioned to, or are actively participating in another research lab or research opportunity.	5.1% (29)	7.5% (23)	"The research that I was completing did not align with my future career goals and so I looked (and found) another undergraduate research opportunity." (PUI)	2.3% (6)	"I am studying at the marine lab next semester and will work in another lab while I am there, so I considered leaving my current lab and continuing research with the marine lab if I enjoy it more." (Master's)
Student realizes their lack of ability, skill, or content knowledge	Student considered leaving or left their research because they feel as though they struggle in their research experience due to a lack of content knowledge, lack of ability, or lack of skills. Additionally, they can describe that they have difficulties meeting expectations or keeping up in the lab.	4.9% (28)	4.2% (13)	"The project I was working on didn't have anything to do with the day-to-day projects the lab was working on, and I did not have enough experience to guide my own project." (Public R1)	5.7% (15)	"I felt that I was not as ready as I would have liked to have been before beginning my research experience." (Master's)
Lack of structure/ disorganized lab	Student considered leaving or left their research experience because the lab is lacking structure or because the lab or their mentor is disorganized.	4.5% (26)	5.9% (18)	"Furthermore, the lab wasn't organized with deadlines and it seemed stressful for others in the group that were using the research as their capstone." (Master's)	3.0% (8)	"The lab was extremely disorganized. There was no set schedule for me to come in." (Public R1)

Table S6. Student responses to the open-ended question about why they wanted to stay in their first URE. Codes that are reported by >5% of students are included.

Reasons why students chose to stay in their research experience	Description	All students	Students who never considered leaving (stayers)		Students who considered leaving but stayed (waverers)	
		% (n) n=955	% (n) n=690	Student Quote (Institution Type)	% (n) n=265	Student Quote (Institution Type)
Broadly enjoys the research experience	Student stayed in research because they enjoy the research. This category includes responses describing that the student broadly enjoys the research experience, as well as responses that indicate that the student is interested in their research topic, likes their lab work, or enjoys doing a specific technique.	41.9% (400)	47.2% (326)	"I have a passion. Whenever I have the opportunity to prosper in what I love, I always do that. Working in a lab helped me experience new things because nothing was limited and everything was hands on." (Public R1)	27.9% (74)	"I enjoy the subject matter that we are studying, even though it does not have much to do with what I want to do in the future." (Private R1)
Positive lab environment	Student stayed in research because they perceive a positive lab environment or have developed positive relationships with or think positively of others in the lab besides their mentor, such as other undergrads or graduate students.	36.9% (352)	42.5% (293)	"I always felt supported by my PI and the other members of the lab. I enjoy the team dynamic and I love the techniques we use." (Master's)	22.3% (59)	"The people in this lab are amazing and fun to work with. It's a small community that I would love to stay a part of - plus I would still like to volunteer some time to help them in lab chores." (Public R1)
Positive relationship with mentor	Student stayed in research because they have developed a positive relationship with their research mentor or they think positively of their research mentor. A student's PI or anyone for whom a student indicated they worked (e.g. their grad student or post-doc) was considered a mentor.	33.6% (321)	39.3% (271)	"The lead researcher is a fabulous mentor. I have learned so much from her and she has trusted me to do my work. Other students, […], are also amazing people to work around." (Master's)	18.9% (50)	"I loved my mentor and the work that I was doing. My research gave me peace." (PUI)
Opportunity to learn	Student stayed in research because they	20.2% (193)	23.6% (163)	"The primary reason was that I enjoyed what	11.3% (30)	"Wanted to continue

	are already learning or have the opportunity to learn something (e.g. content, skills) from their experience.			"I was learning. I was in a genetics lab and genetics was very new to me so I was learning a lot about different genes and metabolic pathways and ways of examining those genes through microscopy, viability, etc. The faculty member I was conducting research with and the other students in the lab were very nice, helpful, and understanding." (Private R1)		learning, and lab mentors gave me a lot of responsibility." (Public R1)
Career benefit	Student stayed in research because research is important for their future career or post-graduate plans. Student indicates that research is important for medical or graduate school, that they are doing research to clarify their career goals, or that they need a letter of recommendation.	15.4% (147)	15.5% (107)	"I loved my research experience. I wanted to stay with it because it pertained to my future career and gave me hands-on experience learning about something that I loved. I loved my bosses and I loved the environment that I worked in." (Master's)	15.8% (42)	"Doing an honors thesis would look good on my resume and I liked my lab manager and PI and was interested in the topic I am researching." (Private R1)
Receives sufficient help or guidance	Student stayed in research because someone in the lab is available to help them with their research, answer their questions, or to assist them if they need help, guidance, or direction.	12.6% (120)	14.8% (102)	"I appreciated the open communication between everyone in my lab. If there was something that I wasn't sure of, then I could always go to anyone and ask for help without hesitation." (Public R1)	6.8% (18)	"My advisor asked me why I wasn't showing up to the meetings anymore, and after talking to her she encouraged me to work through it that this was only a small period of time compared to what I am going to do with the rest of my life. She really helped me through a lot of personal issues with family members passing away, dealing with a full school load, and working all the time. She encouraged me to go to counseling on campus, which has helped tremendously." (Master's)
Has independence	Student stayed in their research experience because they have the	8.7% (83)	9.1% (63)	"I really loved the lab culture. I thought the work on tumor	7.5% (20)	"As I learned more about the research topic I became more interested

	opportunity to work independently. Specifically, a student can describe that they work on their own research project, have asked their own research question, or feel that they have ownership over a particular project.			microenvironment was interesting and cutting-edge. I got along well with the PI and the grad student. I felt I had a good amount of support to do independent work, while also able to ask questions as needed. They supported my growth and development as a scientist." (Private R1)		in it and was allowed to pursue my own research question within the lab. Learning more about the subject I was interested in helped solidify my decision to stay in the lab." (Master's)
Commitment and follow-through	Student stayed in their research experience because they have a sense of commitment to their research or their research project. Specifically, wanting to see a research project through, wanting to make more progress on their research, or that there is more research to be done.	8.3% (79)	7.5% (52)	"I do not quit. I did not like it but it was a group project and the people were not effective in the group. There also needed to be more guidance as an undergrad for my first experience." (Private R1)	10.2% (27)	"I felt indebted to the people in my lab who taught me so much over the years." (Public R1)
Personal growth or development in research	Student stayed in their research experience because their research provides them with increased responsibilities, or opportunities for leadership or personal growth and development.	7.7% (74)	8.0% (55)	"I felt that the lab I joined allowed me to develop personally and professionally from the first day I joined until now." (Private R1)	7.2% (19)	"I reasoned that the commute wasn't that bad after doing it for weeks and that the PI was actually starting to trust me with things to do so I started mixing reagents to make buffers for the other grad students and then she taught me how to pass cells. I am slowly working towards having my own project." (PUI)
Academic benefit	Student stayed in their research experience because they want to achieve a specific academic benefit, such as doing an honors thesis, receiving a grade, or receiving credit.	7.4% (71)	6.5% (45)	"I like the people in the lab and I learn a lot of really interesting things. I also need the project for my undergraduate honors thesis." (Public R1)	9.8% (26)	"I had to stay in order to earn class credit." (PUI)
Lab is accommodating	Student stayed in their research experience because they appreciate how accommodating the lab is of their schedule.	4.9% (47)	5.2% (36)	"It was a nice lab environment and my PI was incredibly understanding of my course load."	4.2% (11)	"I discussed with my mentor and he was very understanding! We worked out a plan where I can still be involved in

	Specifically, students often describe how the lab, or their mentor, allows them to work when they want, allows them to work from different locations, or that the lab is accommodating of personal or academic demands on their time.			(Master's)		his research and learn new skills without having to feel overwhelmed." (Master's)
Research product	Student stayed in their research experience because they want a research product, such as a published paper or manuscript. This category also includes students who indicate that they want to present their research or present a poster.	3.7% (35)	3.8% (26)	"I was interested in the research that I was doing and I wanted to see the outcome. Research gave me an opportunity to apply all the knowledge I learned inside the classroom through a hands-on application. Also, I was hoping to gain a possible publication." (PUI)	3.4% (9)	"I have the opportunity to be published and gain respect among peers and the lab staff including the PI." (Public R1)