PREPARED BY :
NATALIE WALLS
LAUREN HINES
HÉLÈNE DOERFLINGER

ASTP REPORT

2023-2024

UNIVERSITY OF CAMBRIDGE
St Catharine's College Cambridge
Gurdon INSTITUTE
Isaac Newton Trust

Table of Contents

Executive Summary

The Aspiring Scientists Training Programme (ASTP) aims to support students from under-represented backgrounds in applying to scientific courses at the University of Cambridge and other leading institutions. By offering participants experience of working in a research lab, stay in a university college, and the chance to network with scientists, the programme allows students to make informed decisions about higher education and careers. Research labs are often difficult to access, particularly for students who do not have personal connections to people who work in science and academia. The training programme seeks to break down this barrier and demonstrate that scientific careers, higher education, and the University of Cambridge, are attainable and welcoming environments for students from all backgrounds.

This year's iteration of the ASTP was the largest to date, hosting 38 students across two colleges and eight scientific institutes. This expansion was thanks to the funding provided by the Isaac Newton Trust Widening Participation and Induction Fund.

Students worked on a range of lab-based projects over the course of the week, assisting their mentors with ongoing research, learning valuable scientific skills and techniques, and working on a presentation which they delivered to their peers and lab groups on the final day.

Alongside their lab work, students received a workshop on applying to the University of Cambridge from outreach staff at St Catharine's College, and a talk on presentation skills by Professor Giles Yeo. There were also a range of evening activities, including a punting tour, a formal college dinner, and a quiz night, allowing the aspiring scientists to get a taste of university life and socialise together. Food and accommodation were provided by St Catharine's College and Pembroke College.

Student Selection

A total of 717 students from across the UK applied to participate in the ASTP 2024. Selection was based on eligibility and widening participation criteria.

- **83.5%** of ASTP applicants were from a minority ethnic background, compared to 37% across English state-funded secondary schools.
- **5.6%** of applicants identified as young carers, compared to 0.9% of English state-funded secondary school students.

Participant Evaluation

Students

- **100%** of surveyed students would recommend ASTP to a friend or fellow student.
- **88%** or more reported developing a network with scientists, gaining relevant CV experience, and discovering what it's like to be a scientist and Cambridge University life.
- Student feedback suggests that the programme allowed students to better understand universities and feel more comfortable in higher education and academic environments.

What students said about the programme: "***[I gained]...a deeper insight into lab work, technique and career (I now know what I want to do when I'm older)***"

"I want to thank you for coming with this program. You have no idea how much helpful this program is. For me, who has never been to this sort of lab or even to this sort of environment, this was mesmerising."

Researchers

- **100%** of respondents felt "somewhat positive" or "very positive" about ASTP.
- All respondents indicated they were "likely" or "very likely" to participate in ASTP in the future.

What researchers said about the programme: ***"I've learned how to communicate my work in a simple, more accessible manner that captivates the attention of students and allows them to understand the potential impact of the work we do.***"

"***We have gained a broader understanding of what is needed to host work experience students and are hoping that we can prepare a framework that allows us to offer work experience opportunities beyond our involvement in ASTP.***"

Financial Report

- Programme's allocated budget: £30,237.90
- Actual spend: *£26,951.17*
- Travel spend: £3,550.52 (projected £5,400)

Looking Forward: ASTP 2025

- Plans to expand the programme to accommodate 50 students, leveraging funding from INT and additional support from other sources.
- Focused efforts to increase applications from North England, Scotland, Wales, and Northern Ireland, as well as remote and rural areas.
- We will continue to develop and improve communication frameworks to ensure efficient and effective communication within the growing cohort of researchers, labs and institutes involved in the programme in 2024/25.

Programme Applications

Widening Participation Selection Criteria

Students from non-fee-paying schools with predicted As in Biology, Chemistry and another science at their A-level are chosen according to widening participation criteria. The selection matrix was created in accordance with guidance from the University of Cambridge Admissions Office (CAO) in the report "WP Selection Criteria – Guidance for Practitioners". Indicators were grouped by priority level, except for 'in care' which was treated as a 'super flag' (as advised by the CAO).

The selection matrix detailing all of the criteria is shown below (*Figure 1*).

In response to request from the INT, the programme team organised an online event for unsuccessful applicants which will take place in September 2024, featuring an abridged version of the Admissions Talk from St Catharine's, a live Q&A with researchers and links to resources for A-levels, further study and careers. More information about this event can be found at the link : https://www.eventbrite.co.uk/e/943524636587?aff=oddtdtcreator

Criterion	Score
In care	100
FSM/pupil premium	5
Underrepresented ethnic group	3
Disrupted education	3
Polar	2
First generation	1

Figure 1: Selection matrix

Applicant Demographics

Applicant data was compared to the national data set from Gov.uk from their "Schools, pupils and their characteristics" dataset (year 2023/2024). This data only reports on English state schools, but provides a reasonable benchmark to ensure that we are reaching the demographics targeted by the programme.

Overall, the report states that 37% of students are from a minority ethnic background, compared to 83.5% of ASTP applicants in 2024. In this instance, the report considers any student who is not "White British" as belonging to a minority ethnic background. Of the selected students who participated in the programme, 95% (36 out of 38) belong to a minority ethnic group.

Looking more closely at the data, and in particular the ethnic groups identified by the CAO as being underrepresented, we can see that most of these groups are overrepresented in our applicants. 63% of selected participants belong to these "underrepresented ethnic groups" (highlighted in *figure 2*).

Applicant Ethnicity Data

Compared to National Census and National Schools Datasets

Ethnicity/Ethnic Group	English school pupils (2023/24) (%)	ASTP 2023 Applicants (%)	ASTP 2024 Applicants (%)
Asian or Asian British Bangladeshi*	1.8	6.56	6.42
Chinese	0.8	3.77	5.72
Asian or Asian British Indian	4.0	12.15	16.60
Asian or Asian British Pakistani*	4.6	8.66	8.51
Other Asian Background	2.4	6.98	9.76
Black or Black British African*	4.8	17.88	18
Black or Black British Caribbean*	0.9	0.56	1.53
Other Black background*	0.8	0.56	0.14
Mixed White and Asian	1.7	1.68	2.23
Mixed White and Black African*	0.9	1.26	0.84
Mixed White and Black Caribbean*	1.6	0.14	1.39
Other Mixed background	2.8	3.07	1.39
White British	61.3	19.69	14.46
White Irish	0.2	1.12	0.84
Gypsy, Roma, Traveller*	0.4	0.14	0.56
Other White background	7.2	7.96	4.46
Other Ethnic background	2.4	11.18	5.16
Prefer not to say	1.7	1.40	0.56

Figure 2: Ethnicities highlighted in lavender are treated as underrepresented by the Cambridge University Admissions Office, and in the ASTP selection.

A significant effort was made this year to encourage applications from Black Caribbean and Gypsy, Roma, Traveller backgrounds, as these were two groups that were consistently underrepresented in the applicants. These efforts have been successful in significantly increasing the percentage of Black Caribbean students applying this year (up from **0.56%** in 2023 to **1.53%** in 2024) and those from Gypsy, Roma, Traveller backgrounds (up from **0.14%** in 2023 to **0.56%** in 2024)., bringing the overall percentage higher than the national percentage reported by gov.uk for both groups.

Young carers

5.6% of applicants identified as a young carer, compared to 0.9% of students in English state-funded secondary schools.

Free School Meals / Pupil Premium

25.2% of applicants stated that they are eligible for free school meals (FSM) or pupil premium, roughly equivalent to 24.6% in all state-funded English secondary schools. In the programme, FSM is used as a proxy for household income, so more efforts could be made in 2025 to encourage students eligible for FSM to apply for the programme. The report from gov.uk also includes data on both FSM and ethnicity, so this dataset could be used to inform targeted promotion and leverage our success in encouraging students from underrepresented ethnic groups to apply.

Care-Experienced

According to gov.uk, in 2018-19, only 13% of pupils who had been in the care system continuously for 12 months or more entered higher education compared to 43% of all other pupils. For this reason, these students are treated as 'high-priority' applicants, as advised by the University's Widening Participation team.

Around 0.7% of children in England are care-experienced. In 2024, 1.9% of ASTP applicants stated that they are or have been in local authority care in the UK.

We received 13 applications from students stating that they had care experience and hosted 1 care-experienced student. Unfortunately, these students were less likely to meet the academic eligibility criteria for the programme set by the host colleges. Looking forward, there may be scope to further support students meeting this criterion in 2025.

Geographical Spread of Applicants

Figures 3 and 4 below show the geographical spread of the applicants for the programme in 2024 and the 2023. In both years we received the majority of our applications from London, the south of England and the Midlands.

Despite efforts being made to encourage applicants from further afield, we still received fewer than expected applications from Scotland, Northern Ireland and Wales, as well as the North East of England, and rural/remote areas in general. The programme did, however, welcome its furthest travelled student to date in 2024, joining us from Northern Ireland (see figure 5).

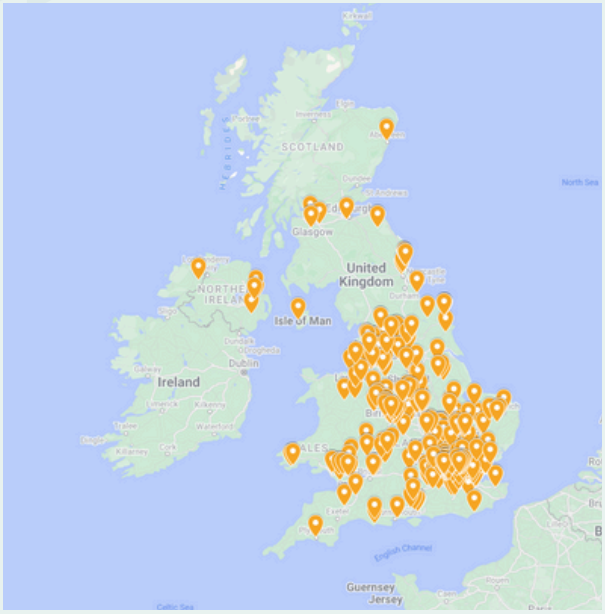


Figure 3 (Left): Applicant postcodes 2023;
Figure 4 (Right): Applicant postcodes 2024. Both figures show **only** UK postcodes. Applicants from outside of the UK are not eligible and have therefore been removed from the figures.

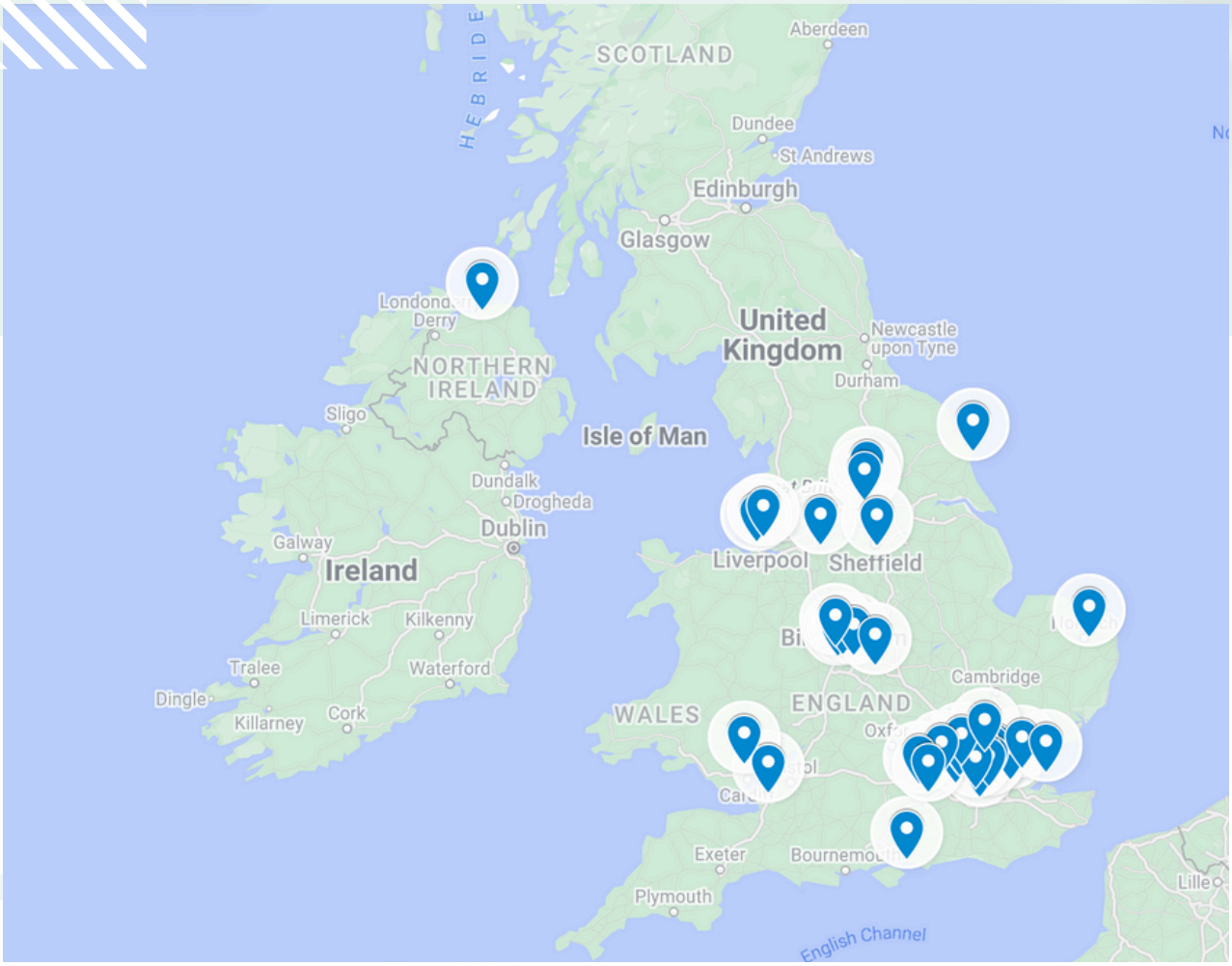


Figure 5: The map shows the geographical spread of the selected students who completed a placement as part of the ASTP 2024.

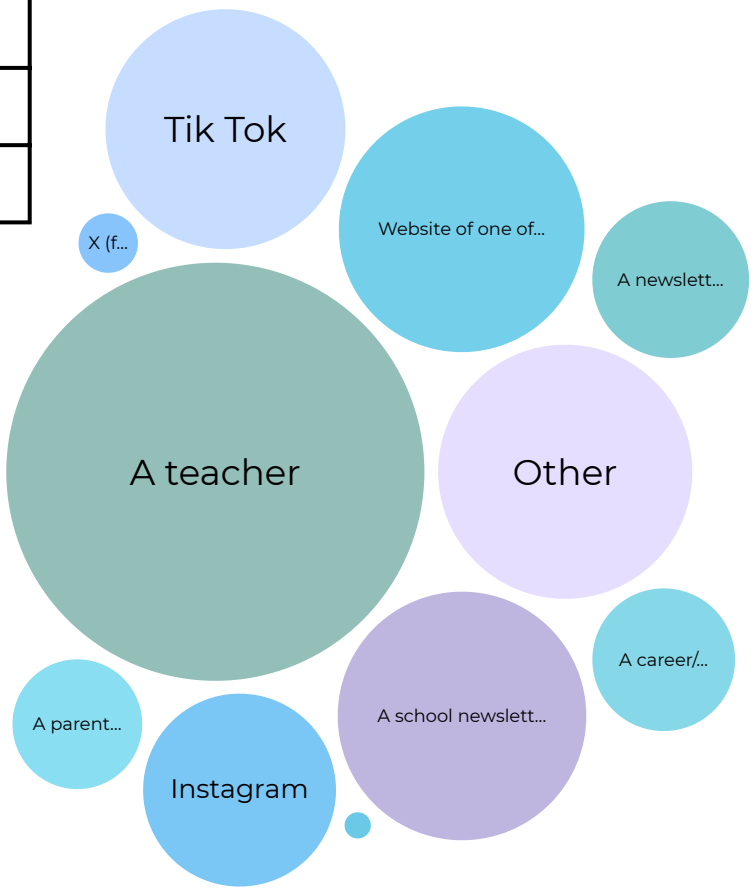
To address the underrepresentation of applicants from Scotland, Northern Ireland, Wales, the North East of England, and rural or remote areas, we will actively work to diversify the geographical spread of our applicants in the coming year. This will include targeted outreach and engagement initiatives, such as collaborating with schools and colleges in these regions, offering virtual information sessions to broaden accessibility, and working more strategically with the CAO and School Liaison Officer networks within the university. By implementing these strategies, we aim to ensure that students from across the UK have greater awareness of, and access to, the programme.

Marketing & Promotion

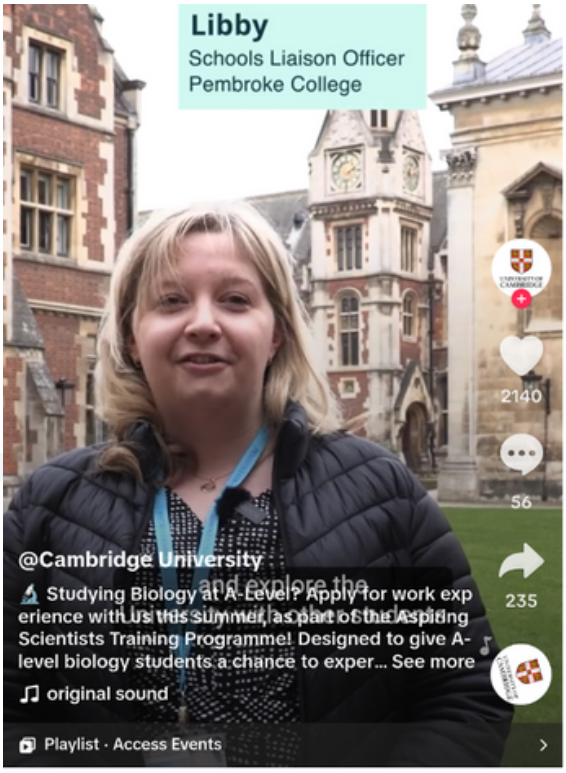
How are potential applicants finding out about the programme?

A teacher	35.62%
A school newsletter	12.59%
A newsletter from elsewhere	5.01%
A career/guidance counsellor	4.15%
A parent/carer	3.43%
Website of one of the depts.	12.30%
Facebook	0.14%
Instagram	7.58%
X (formerly Twitter)	0.72%
Tik Tok	11.73%
Other	13.16%

Other sources of information: 56 (8%) people stated that a friend told them about the programme, 5 mentioned Zero Gravity, 9 reported seeing the programme on LinkedIn, 5 said they found it via a web search, 1 said ProjectUp, and 3 mentioned Click Cambridge.



How are potential applicants finding out about the programme?



56 Comments

Going forward to 2025, we will continue to focus efforts on:

- **Communicate with teachers** about the programme via the Cambridge Admissions Office newsletter, the School Liaison Officers' network of schools and our own teacher contact lists.
- Keep the Gurdon Institute website updated and optimised for search engines (and encourage other departments to do the same).
- Have a strong **social media promotion plan**, aiming to again liaise with the Cambridge University Office for External Affairs and Communication (OEAC) to create content for the University Tik Tok account.

Evaluation

Students

Students were asked to complete an anonymous survey before and after taking part in their placement to evaluate the impact of participation in the programme.

With ASTP, I can:	Pre-	Post-
Develop a network and relationships with scientists	68.9%	92.3%
Get a relevant experience to put on my CV for applying to university	86.2%	88.4%
Find out what it's like to be a scientist or work in a research environment	93.1%	96.1%
Understand the research conducted in your lab	68.9%	80.8%
Find out what Cambridge University life is about	51.7%	73.1%

100% of respondents said that they would recommend ASTP to a friend or fellow student.

Student Perception

Analysis of participants' perceptions of research, higher education and academia before and after their participation in ASTP

	Pre-	Post-	% change
I want to become a scientist.	66	84	27.3%
I want to have a job that uses science.	93	93	0%
There are people like me who work in science.	73	80	9.6%
If you want to, anyone can become a scientist.	68	75	10.3%
I could study a science subject at university level.	91	95	4.4%
I know how to use scientific evidence to make an argument.	66	88	33.3%
Other people think of me as a science person.	77	75	-2.3%
I don't think I'm clever enough to study any of the sciences at university level.	22	27	22.7%
I know a lot about going to university.	51	75	47.1%
I am planning on going to university in the future.	96	88	-8.3%
I would like to apply to a very selective university.	79	88	11.4%
I would fit in at university.	70	88	25.7%
I feel comfortable in a university environment.	64	87	35.9%
I would fit in at a Russell Group University.	77	90	16.9%

University

The biggest percentage change between before and after the programme was in response to the statement "I know a lot about going to university" (47.1% increase in agreement from participants). There were also significant increases in agreement with the statements "I feel comfortable in a university environment" (35.9%) and "I would fit in at university" (25.7%). These responses suggest that the programme is successful in helping participants gain insight into higher education systems and feel more at ease in academic settings.

Career aspirations

Another significant increase in agreement from respondents was in response to the statement "I want to become a scientist," with an increase of 27.3%. Many of the students come to the programme with aspirations of going into medicine, but they often broaden their understanding of the ways that they may be able to be involved in biology and biomedical sciences outside of the clinical setting.

"[I gained]...a deeper insight into lab work, technique and career (I now know what I want to do when I'm older)" – ASTP Student (Wellcome/CRUK Gurdon Institute)

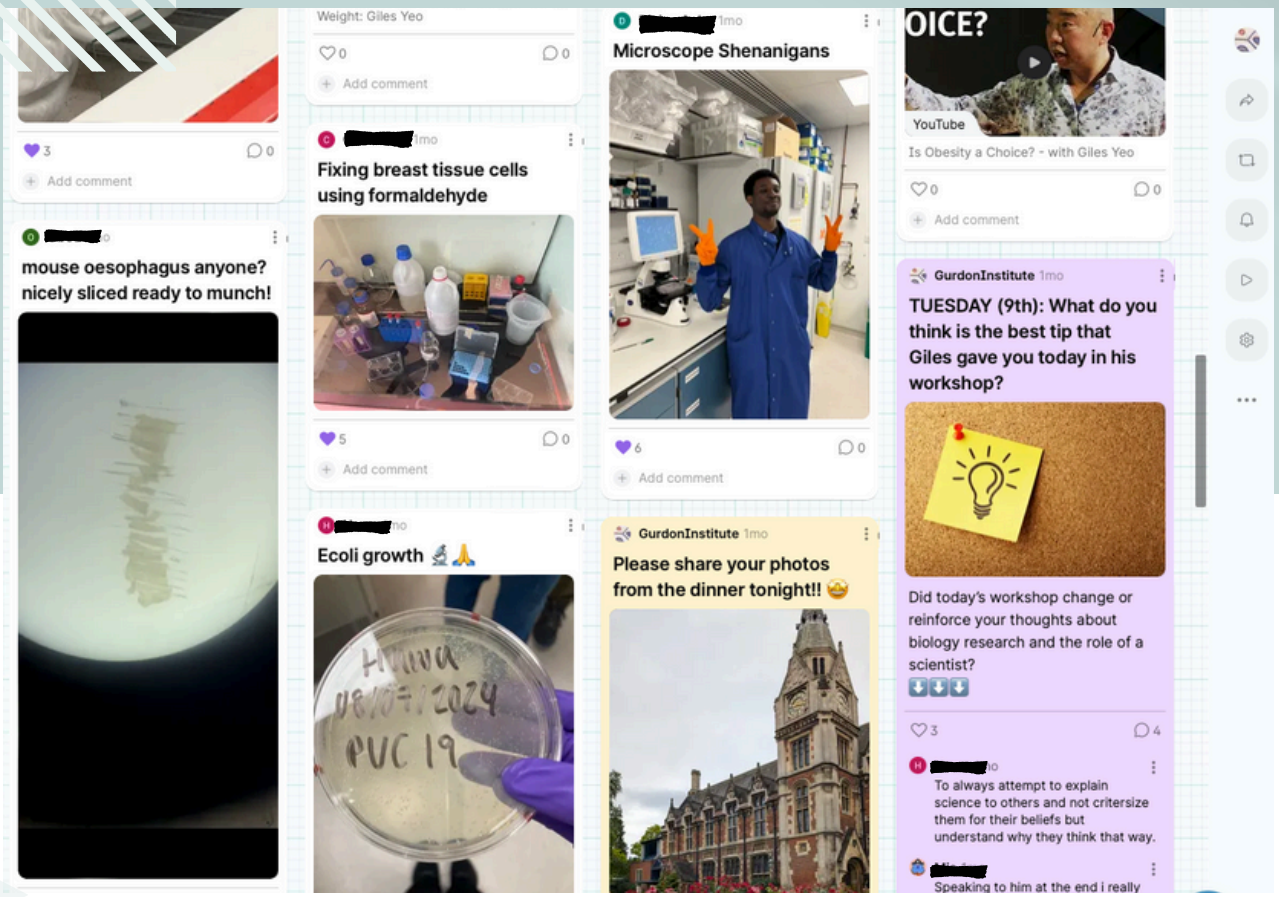
Laboratory & research experience

As with previous years, the students seem more confident in their understanding of using science in context after participating in the programme. There was an increase of 33.3% in response to the statement "I know how to use scientific evidence to make an argument".

Areas for consideration in 2025

There was an increase in respondents agreeing to the statement "I don't think I'm clever enough to study any of the sciences at university level" (22.7%) after participating in the programme. There could be two possible reasons for this response. The first is that the students told us, both in the surveys and during the programme, that they were in awe of the researchers that they were working with, and this could potentially make them feel like they were not clever enough to do the job themselves. The other explanation concerns how the question is worded in the survey. This is the only statement formulated under a negative format, and that can skew the results, so we will change it to read "I think I am clever enough to study..." in the 2025 evaluation. Going forward, we will also consider ways to ensure that we continually reinforce the idea that some of our researchers were exactly like the ASTP students once and that they can follow a similar path in research if they choose.

There is a slight downward trend in agreement with the statement, "I am planning on going to university in the future". This trend is due to one respondent who said they "strongly disagree" with the statement, but they "agree" with the statement "I would like to apply to a very selective university" and shared their aspirations of which universities they intend to apply for, so we can assume they may have a mistake in completing the form.



Student Padlets

This year, the programme team set up a Padlet link for each of the host institutions, which every student at the institution had access to. The aim was to create a platform where the students could share their experiences, photos and reflections throughout the week. It also provides a way for the coordinators to ask questions and share information with their cohort.

The institutions engaged with the Padlets to varying degrees, with some students using it more than others. In the cases where the students did use the platform, it provided valuable insight and ongoing evaluation for the coordinator. It also, rather unexpectedly, was used as a proxy social media platform for the students to share their photos and comment on one another's work, offering support and encouragement to one another throughout the week.

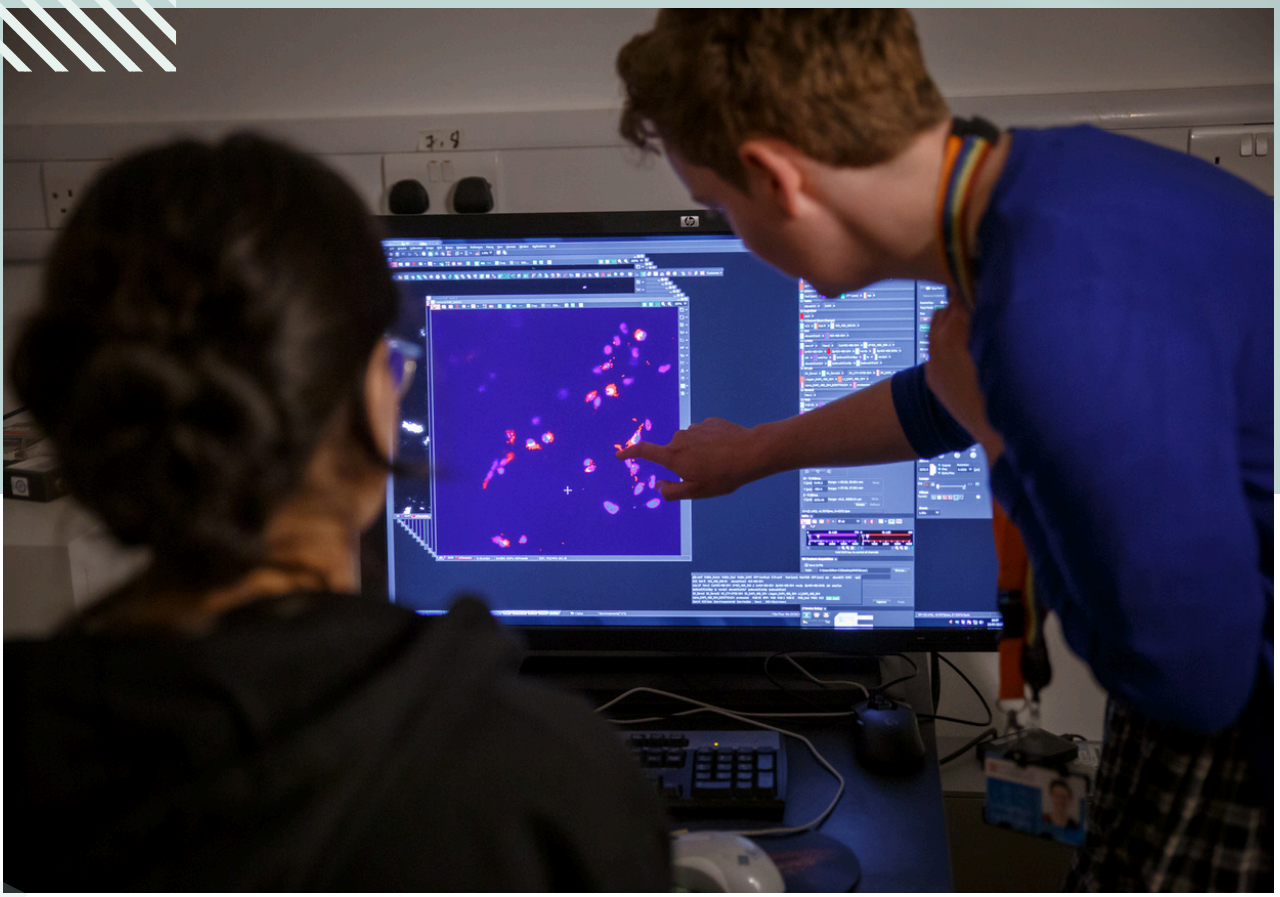
padlet.com

Student Feedback

"*I want to thank you coming with this program. You have no idea how much helpful this program is. For me who has never been to this sort of lab or even been to this sort of environment, this was mesmerising*." – ASTP Student (MRC-Toxicology Unit)

"*My supervisor was amazing and he made sure I was doing plenty of work and understanding the things I was doing even if it meant he had to repeat himself multiple times*" – ASTP Student (Mitochondrial Biology Unit)

"I felt that my experience was tailored to me and my interest so i genuinely found myself immersed in the work" – ASTP Student (Pharmacology)



Higher Education Access Tracker (HEAT)

As part of our commitment to monitoring the success and impact of the ASTP, we have integrated the student data into the Higher Education Access Tracker (HEAT). This allows us to track participants' journeys in higher education and analyse where they continue their studies, as well as the subjects they choose. By leveraging HEAT as a long-term evaluation tool, we are beginning to gain valuable insights into the effectiveness of our programme over time, informing future strategies and helping to ensure that we are meeting our objectives in supporting student progression into higher education and science.

Researcher Feedback

28 researchers and staff from the host institutions responded to the post-programme survey.

20 (71.4%) of the respondents said that they felt “very positive” about their experience being part of the programme, with 7 (25%) feeling “somewhat positive” and 1 (3.6%) feeling “neutral”. None of the respondents reported feeling “somewhat negative” or “very negative”.

When asked what, if anything, they had gained from participating in the programme, the most common answer from researchers was that they gained experience in teaching/mentoring and developed their skills in communicating with non-experts about their work. Many also commented on how they enjoyed working with the young people and that their energy and enthusiasm were motivating and rewarding for their mentors.

> *"I've learned how to communicate my work in a simple, more accessible manner that captivates the attention of students and allows them to understand the potential impact of the work we do. Additionally, I learned how to better communicate with teenagers - something I hadn't done in a while! I found it very rewarding to see them interested, amazed at times by what they were seeing and doing."* - Researcher (Wellcome/CRUK Gurdon Institute)

When asked what could be improved, the following suggestions were made by researchers:

- Providing the schedule further in advance
- Some resources for the hosts about the level of knowledge that the students will have (particularly for those who did not attend school in the UK)

The programme team will take those suggestions and implement them in the programme for 2025.

When asked how likely they would be to take part in ASTP (or a similar programme) again, 84.2% of respondents said "likely" or "very likely", with 10.5% saying that they would be "neither likely nor unlikely".

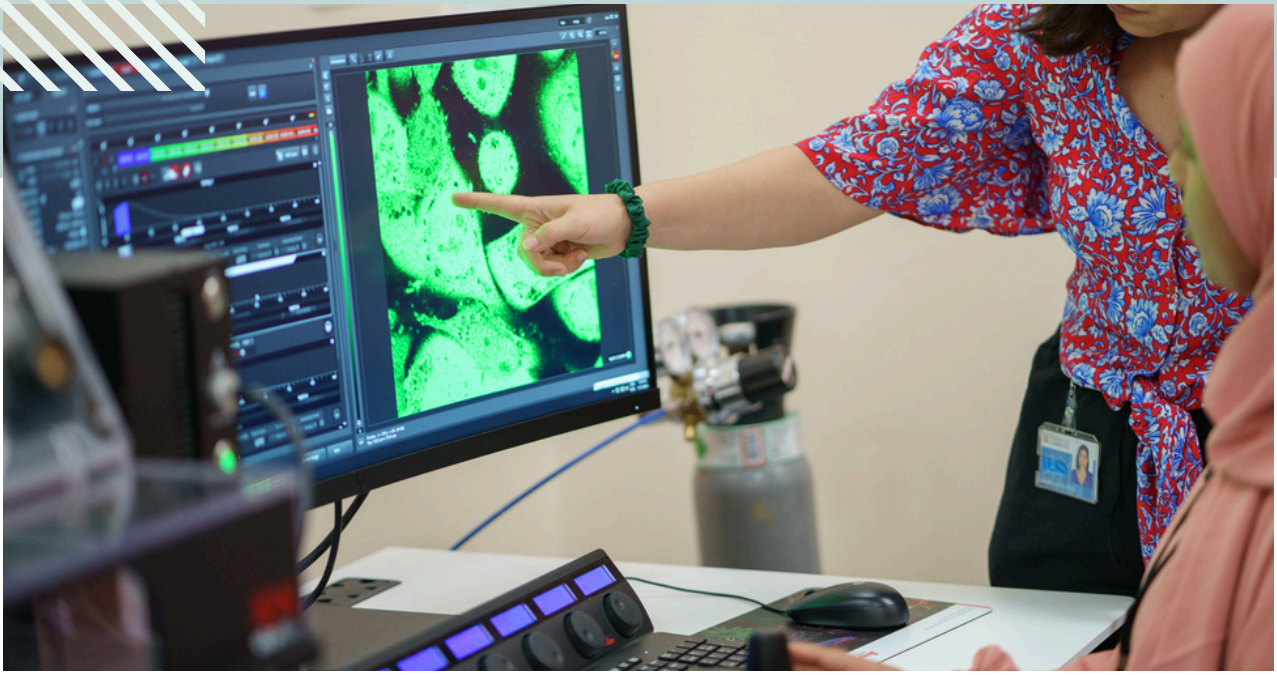
"We have gained a broader understanding of what is needed to host work experience students and are hoping that we can prepare a framework that allows us to offer work experience opportunities beyond our involvement in ASTP."

– Host institute participant (MRC-Toxicology Unit)

Financial Report

Expenditure	Budget	Total	Actual Spend
For students	**Per student**	**For 40 students**	**For 38 students**
Travel cost to Cambridge	Up to £100	£4,000	£3,198.12
Accommodation & Meals (inc. chaperones)	£350 (£70 x 5 days)	£16,100	£18,152.85
Evening actitivies (4 days)	£10	£400	£1,289.75
Transport from college to Biomedical Campus	£35 (£7 x 5days)	£1,400	£352.40
Chaperone (one per 8 students)	**Per person**	**For 6 chaperones**	**For 4 chaperones**
Salary for the chaperone	£945 (5 evenings & nights)	£5,670	£2,482.18
Enhanced DBS checks	£38	£228	£226
Other			
Photographer	£1,000	£1,000	£1,195.20
Contingency (5% of total budget)	£1,439.90	£1,439.90	£54.67

£30,237.90	**£26,951.17**



The total allocated amount was £30,237.90, while actual expenditure came to **£26,951.17**. The key reason for this variance is the reduced number of participants, which decreased from the planned 40 to 38 students. This reduction affected multiple areas, including travel, accommodation, meals, and transport, leading to lower overall costs.

Additionally, we optimised certain expenses:

- Travel: More cost-effective arrangements resulted in savings, with actual travel costs at £3,550.52 instead of the budgeted £5,400.
- Chaperones: The colleges hired with four chaperones instead of the six initially planned, reducing costs from £5,670 to £2,482.18.
- Transport: When writing the original budget we necessarily planned enough budget to cover students coming from far/remote places and/or places not well served by public transit. It transpired that most students came from cities easily accessible from Cambridge so costs were lower. We also required fewer taxis than in previous years when we were accommodating students with limited mobility.
- Contingency: Only £54.67 of the £1,439.90 contingency fund was needed, as most costs remained within planned amounts.

These factors allowed us to deliver a high-quality programme at a lower cost, despite securing enough funding to support students with additional needs, both logistically and in terms of participation during the week.

Conclusions & Future Plans

Overall, the 2024 ASTP had a significant positive impact on students' perceptions and ambitions regarding careers in biological sciences and academia.

Looking forward to 2025

We are delighted to have secured part-funding for the 2025 programme from the Isaac Newton Trust. We are aiming to offer 50 places next year, subject to securing additional funding. The programme will be led by St Catharine's College and the Gurdon Institute.

Programme developments

Consistency & coordination

Some students and staff mentioned in their feedback that some aspects of the programme could have been more coordinated to ensure things ran more smoothly. While overall, the programme ran as planned, due to the increase in participating students, departments and labs, some of the communication and coordination systems used in previous years were not quite adequate to accommodate the larger cohort of participants. So some messages and plans were miscommunicated and/or misunderstood. Going forward, we plan to create a more robust system of communicating with the departments, students and chaperones to avoid confusion. We will also communicate all the relevant information further in advance to ensure adequate time for participants to plan and prepare.

Guidance on student knowledge

Some comments suggested that the researchers would benefit from some guidance on the AS curriculum and what the students know about biological concepts before participating in the programme. We plan to create a guidance document to share with host labs and departments that will outline the relevant topics covered at the AS/A level to help the researchers and workshop facilitators plan their activities and how they will communicate their work effectively.

Free time

Despite lessening the number of scheduled activities that the students took part in during their lab time, the feedback suggests that they would appreciate more time to explore Cambridge. We will work with the colleges and chaperones to ensure that all the students are given ample time to relax and enjoy the city during their stay.

Lab work & networking

As with previous years, the students overwhelmingly remarked that they most enjoyed meeting the scientists and getting involved with research in the labs.

"Talking to the scientists doing a PhD. Even Just finding out how knowledgeable they were and how humble they were, regardless of their achievements, was really eye-opening" – ASTP Student (MRC-Toxicology Unit) in response to being asked, "What did you like most about the work experience programme?"

"The friendliness of the academics and the challenging labs we had to make us think outside the box" – ASTP student (Pharmacology) in response to being asked "What did you like most about the work experience programme?"

Due to the positive response regarding the researchers and the lab work, we will continue to emphasise that one key way that the researchers can have a positive impact on their students is to take a friendly and welcoming approach when inviting the students into their labs and continue to give them an authentic experience of what it is like to work in a research setting.

Conclusion

The ASTP 2024 has made significant strides in changing participants' perceptions of higher education and careers in science. The programme has empowered students to aim higher, with many expressing newfound confidence and interest in applying to Cambridge and other prestigious institutions. Feedback from both students and researchers highlights the programme's success in inspiring and preparing aspiring scientists. Looking ahead to 2025, we are excited to build on this success and further enhance the programme. We aim to increase participation and expand representation from diverse geographical regions. By continuing to refine our approach and utilise tools like HEAT for comprehensive evaluation, the ASTP remains committed to nurturing the next generation of scientists, ensuring they are well-equipped to pursue their academic and professional aspirations in science. We look forward to welcoming the next cohort of aspiring scientists and supporting them on their journey toward a brighter future in science.

ASTP

Acknowledgements

Lauren Hines and the programme team at St Catharine's college

Hélène Doerflinger & **Natalie Walls**, programme leads at the Wellcome/CRUK Gurdon Institute

Libby Prodger, **Amber Cuttill** and the programme team at Pembroke College

All of the researchers and partners from the host institutions, the **Sainsbury Laboratory**, **Wellcome-MRC Institute of Metabolic Science**, **MRC Mitochondrial Biology Unit**, **Cambridge Institute for Medical Research**, **MRC Toxicology Unit**, **Department of Biochemistry** & **Department of Pharmacology**

The **Cambridge University Office of External Affairs and Communications** who provided promotional support through their social media channels

Funding for the programme is from the **Issac Newton Trust** Widening Participation & Induction Fund