2024
Annual Report

BIOTech Futures Challenge

Better together for 5 years

Contents

5 years of BIOTech Futures

As we approach our 5 years, we reflect on our proud history, who we are today, and look ahead to the next chapter

2019 — **Inaugural Australian challenge held at USYD**
Teams presenting their projects to Her Excellency the Hon. Margaret Beazley. The Challenge was opened by the Vice Chancellor and Principal of USYD Michael Spence.

2020 — **The Challenge was moved online due to COVID safety**
An international team involving collaboration between Abbotsleigh Sydney Australia and International Academy Amman Jordan won the prize for best prototype.

2020 — **Teams presented projects in collaboration with Women NSW – NSW Government**
The Challenge was addressed by the Hon. Bronnie (Bronwyn) Taylor, Minister for Women, Minister for Regional Health, and Minister for Mental Health.

2022 — **Launched BIOTech Connect online student portal**
The Challenge was addressed by the world's top biomedical engineer, Prof Bob Langer from MIT and The Hon. Alister Henskens, Minister for Science, Innovation and Technology.

2023 — **Launched our Specialised Teachers Focus Group**
8 schools from across ANZ adopted the Challenge as part of their schools UOS and classroom activity. Schools from the USA, Romania, New Zealand and the Middle East were involved.

2023 — **Grant received from the Conference Sponsorship Program - NSW Chief Scientist & Engineer (OCSE).**
Travelled to Griffith (regional) NSW to run a 1-day interactive biotechnology workshop to schools across area and had students sign up to the Challenge.

2024 — **Launched the Chronus mentoring portal and digital marking solution**
15 teams formed with students from different schools and regions encouraging cross-sector collaboration and inclusive development.

2024 — **Support and partnership with USYD Engineering Faculty**
The Challenge was addressed by Prof Annamarie Jagose, Provost and Deputy Vice Chancellor and Prof Hesham El Gamal, Dean of Engineering.

Better together for the next 5 years…

BIOTech Futures is purpose-led; our ambition is to inspire and empower the next generation of young minds

As one of Australia's largest high school STEM Challenges, we recognise the far-reaching impact we have on the communities in which we serve and understand the role we play in driving positive change

Creating better experiences together for a better tomorrow

About this report (see more on page 2)

The 2024 Annual Report provides a consolidated summary of BIOTech Futures' performance for the year ended 2024, as well as progress against our strategic agenda to create long-term value for our stakeholders – students, mentors, teachers, sponsors and affiliates.

- Our 2024 highlights and performance review including measured outcomes and measured progress are featured on pages 3 to 17 of this report.
- The way we deliver value to communities throughout the 2024 year and the Challenge is featured on pages 18 to 23 of this report.

Image: First BIOTech Futures Symposium in 2019

Better together for 5 years

This year marks 5 years since BIOTech Futures began its first challenge at the University of Sydney and supported the first teams of high school students.

Some things never change. Service is as important as it's always been. Today, over 2,500 student alumni have participated in the BIOTech Futures Challenge, and we proudly serve all the communities in which we operate across Australia and Internationally.

As we celebrate our 5-year mark and look ahead to the future, all of our decisions and actions reinforce our purpose to continue delivering long-term, sustainable value for all our stakeholders.

Creating better experiences together for a better tomorrow

Image: 2024 Core Committee at the end of year Symposium in the Sibyl Centre, USYD

About this report

The 2024 Annual Report for the 53 weeks ended 30 November 2024 contains certain measures of performance and outcomes. These measures may not be directly comparable with other similar program's measures. This is common practice in the industry in which BIOTech Futures operates.

Performance information

Performance measures are used by the committee as the primary measure of assessing the performance of BIOTech Futures and its individual segments.

The committee believes that these measures assist in providing meaningful information on the underlying drivers of the program, performance and trends, as well as the position of BIOTech Futures as an Australian leader in providing outreach and accessible STEM activities to school goers.

Performance measures are also used to enhance the comparability of information between reporting periods to aid the reader in understanding BIOTech Futures' performance over time. Consequently, performance measures are used by the committee for performance analysis, planning, reporting and have remain consistent with the prior year. Performance measures are not subject to audit or review.

Acknowledgement of Country

BIOTech Futures acknowledges the many Traditional Owners of the lands on which we operate and pay our respects to their Elders past and present and emerging.

We remain committed to actively contributing to Australia's reconciliation journey through listening and learning, empowering more diverse voices and working together for a better tomorrow. BIOTech Futures reaffirms our support for the Uluru Statement from the Heart, and its calls for a First Nations Voice to Parliament enshrined in the Constitution.

"Walking together"
Copyright free artwork by KC Rae

Disclaimer

This report contains forward looking statements, including but not limited to statements regarding trends in student preferences; goals, targets, plans, strategies and objectives of BIOTech Futures; assumed near and long-term scenarios and transition pathways; the development and uptake of certain technologies; and the potential effect of possible future events on the value of BIOTech Futures.

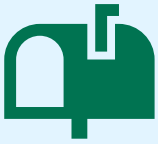
The forward-looking statements in this report are based on the committee's good faith, current expectations and reflect judgements, assumptions and estimates and other information available as at the data of this report. Actual results, circumstances and developments may differ materially from those expressed in this report and readers are cautioned not to place undue reliance on these statements.

Our reporting suite

The 2024 Annual Report provides a consolidated summary of BIOTech Future's performance for the year ended 30 November 2024, as well as progress against our strategic agenda and Sustainability Plan for 2025 to create long-term value for our stakeholders.

- Our Chairs' Report and Operating Review are featured on pages 6, 7 and 10 to 15 of this report and the information in these sections has been verified through BIOTech Futures' internal verification process.
- Our Progress Report on pages 5 and 16 have been audited through BIOTech Futures' internal verification process.

This report should be read in conjunction with the other reports, newsletters and publicly available information that comprise the 2024 reporting suite via www.biotechfuture.org.



News and Mailing List

For important updates on the program and outreach events

2024 Budget & Review

For detailed data on our budget and forward look for 2025

BIOTech Futures Website

For detailed information about our program and upcoming events

2024 Annual Report (this report)

For a detailed review of the 2024 program and outcomes and forward look for 2025

Where to find

	ANNUAL REPORT	NEWSLETTERS & MAILING	WEBSITE & MEDIA	BUDGET (ON REQUEST)
Strategic priorities	●			
Operational performance	●			
Financial performance	○			●
Satellite programs	○	○	●	
Governance, policies and practices	●		●	
Committee composition	●			
Outreach activities	●	●		
Sustainability strategy and performance	●		●	

Key: ○ Key messages ● Comprehensive

The 2024 Annual report and suite can be found online at: www.biotechfutures.org

About BIOTech Futures

Founded in 2019, BIOTech Futures is one of Australia's largest high school innovation programs. Today, we are a Group centred around mentoring and cross-sector collaboration comprising a large engineering and technology network that spans across Australia and regions both close and far.

Key Areas

BIOTech Futures Satellite Chapters are our cornerstone Challenges in Sydney, Victoria and Brisbane with high school students and schools engaging with us through both our extensive network and our online digital Challenge platform.

CHRONUS

BIOTech Futures Mentoring comprises our leading online mentoring program, as well as resource hub, and community forum, enabled by our digital and data capabilities.

THE UNIVERSITY OF SYDNEY
Faculty of Engineering

BIOTech Futures Sponsors and Partners including the University of Sydney Faculty of Engineering who we are now jointly working with to grow and deliver on exceptional value for high school students and the communities we serve.

BIOTech Futures Specialist Teachers Focus Group including schools and teachers from around NSW with the invested interest in support, sustaining and growing the Challenge.

EVENTS
BIOTech Futures

BIOTech Futures Outreach Events work to provide equitable access to biotechnology and innovation workshops and talks throughout the year for students and mentors as well as support and advocate for engineering and technology as future studies for students.

Our reach

High school student alumni since 2019

2,500

New South Wales	2K
Nationally (non-NSW)	1.2K
Internationally	300

Team mentors since 2019

340

Academia	290
Industry	30
Other	20

Student industry-focused Research projects

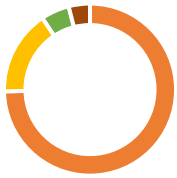
480

Biotechnology	350
Medicine & Health	72
Sustainability	34
Other	24

Our 2024 performance

Participants

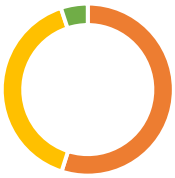
375



NSW	280
Queensland	60
Victoria	20
International	15

Teams

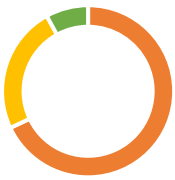
85



Female	280
Male	60
Other	20

Schools

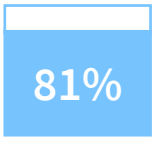
25



Independent	17
Public	6
Regional	2

Our 2024 outcomes

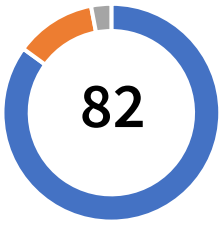
Total responses



284 responses

+182 from 2023

comments



Engagement

Favourable	85%
Neutral	12%
Unfavourable	3%

Professional Development

	score	*change*
Prepared for future studies	94	+1
Developed problem solving skills	95	+2
Developed team building skills	90	+1

STEM Insights

	score	*change*
Inspired to pursue STEM	90	+3
Confidence to pursue STEM	94	+1
Understanding of careers in STEM	85	+2

The value of a better tomorrow

We are pleased to present our Annual Report for 2024 – the year that also marks BIOTech Futures 5th anniversary in December. Having grown from humble beginnings as the BIO Challenge to a group that leads Australia's largest high school innovation challenge, we are proud today to serve our communities across Australia and the world – delivering great value and meeting the appetite of brilliant young minds.

2024 performance

BIOTech Futures performance reflects a challenging operating environment with schools and students feeling the cumulative impact of staff shortages and stretched resourcing within school systems and networks over the last few years which drove real education and productivity pressures. This only further emphasises the importance of BIOTech Futures in staying committed to providing sustainable and long-term excellence in opportunities and mentorship for students who are just becoming introduced to engineering and technology at a more advanced level.

BIOTech Futures student participation and involvement increased by 7% on the prior year with 96% of people feeling that the Challenge made them feel part of a learning community and a further 94% saying it gave them the confident to pursue further studies in STEM.

Reflecting on our broader scorecard, our reputation and community impact grew as measured by the impact survey with an increase in school system involvement and energetic leadership by teachers. This was primarily due to continued collaboration with schools and helping supporting cross-school teams which was one of our 2024 priority areas.

Public

We welcome the opportunity in various meetings with stakeholders to share how we are working to balance the needs of our Challenge participants, our team and dedicated volunteering committee, our sponsors and partners and our community in the context of creating mutually beneficial outcomes for 2025 and beyond amidst nation-wide education pressures.

Team first

We have always admired BIOTech Futures team first approach whether that be through decision making, leadership, or addressing priority areas in the sectors in which we are based.

This year was no different. While we said bittersweet goodbyes to some of our incredible members including Ella (secretary), Dominica (Chair) and Pooria (Outreach Officer) who have moved into other exciting opportunities, we were fortunate enough to welcome Sunny, Rourke and Tasneem to the team whose technical skills and guidance along with the rest of the committee proved invaluable in creating another successful Challenge in 2024.

BIOTech Futures goal has always been to pass forward the shared responsibility of the Challenge to engineers just beginning their academic careers. By doing so it has kept the Challenge energised, fresh with ideas and initiatives, while respecting tenants from prior years and emphasising the value chain we provide. It's this living and breathing evolution of BIOTech Futures which we believe has led it to the position and standing as a program leader within the education sector.

The Chronus mentoring platform and digital marking system as an initiative we pioneered this year is an example of this approach in action. We saw huge gains in mentor-student collaboration and impact which had outflowing effects to student projects and overall perception of the Challenge. Mentor feedback was that they felt more included and supported throughout the Challenge process.

We are confident going forward that this team first approach will continue to enable and drive the group to its full potential.

Working towards a better tomorrow

While it has been a successful year for BIOTech Futures it is important to recognise the challenges felt across school systems over the last year. We reacted quickly to address the need for additional support for teachers and staff thanks to our dedicated teachers on the committee, Fiona and Sunny who worked alongside school systems to provide equitable access to the Challenge. We expect the educational environment to continue to be challenging in 2025 and we will continue to work hard to meet our stakeholder expectations to find great value and deliver better opportunities to participate in engineering and technology.

BIOTech Futures continue our long-standing commitment to contribute to a 1.5°C pathway. This year we emphasised Sustainability as a core project theme and heard a keynote speech by Dr Lucy Buxton at the 2024 Symposium on the importance of sustainable oceans. We are also ensuring that during our outreach events we follow the 2023 17 SDGs to tackle climate change and listen and learn from industry leaders who are advocating in this space.

We remain confident that the investments we have made over many years have built a strong program that remains well positioned to deliver for our stakeholder and create value for our many participants over the long term.

We want to thank all of our hard-working teams and their commitment to our purpose – we are energised and excited by the prospects for BIOTech Futures next 5 years.

Joshua Aarons
Chair

William Nixon
Chair

Being purposeful

Young people have the ability to develop tangible technologies that can change lives. BIOTech Futures rewards those who have the persistence and tenacity to develop their ideas. To have the opportunity to work with an amazing, dedicated and hard-working team to bring out purpose of *creating better experiences together* to life for all our stakeholders is the privilege of a lifetime and I am deeply thankful.

2024 reflection

This year we looked to our teachers and mentors for key feedback. We took on developing teacher focus groups with our extensive international school network to better understand school and student's needs. This purpose-drive action looks towards uplifting and supporting people across diverse backgrounds and cultures.

We also hosted outreach events and worked with regional stakeholders to champion access to STEM and promote STEM awareness as well as learnings from our global contacts that participated from the US this year.

Reflecting on the strong results from this year, we are committed to continuing to deliver across all fronts; by increasing our commitment to rural and regional communities, expanding globally, and building stronger networks across our satellite bases while also learning from our dynamic and evolving environment and social context.

Improving participation in STEM

A primary mission of BIOTech Futures is to introduce STEM to student populations who otherwise would have had reduced access due to geographical and cultural factors. The Challenge began expanding its

Public

reach both to regional Australian and international schools from 2020, and since then has directly included >500 school students who otherwise would have had very limited opportunity to explore STEM.

A specific example includes our visits to, and collaboration with, regional schools across Australia. The BIOTech Futures team has worked with numerous schools in regional NSW (e.g., Uralla Central School and PLC Armidale in 2021, Barellan Central School in 2022, Murrumbidgee Regional High School in 2023), home to many indigenous communities. Besides facilitating students from these schools to participate in the Challenge, BIOTech Futures also delivered STEM enrichment activities in the pre-Challenge visits which were enthusiastically received by the students. Our team has directly communicated with >10 indigenous students and their families during these visits, who have all expressed immense interest in entering a future degree in STEM.

Engagement with STEM

BIOTech Futures is set up to engage every participating student in the direct process of STEM innovation. For our target audience of school students in years 9-12, the Challenge is most likely the first time that they engage with scientific research, with the freedom to innovate, while being grounded in practical skills development to build and communicate their solutions, as well as being mentored by world-class STEM professionals to obtain insights into the industry. Students benefit from their new experiences in scientific inquiry, data analysis, prototype building, and communicating their ideas in STEM.

In addition to the Challenge itself, other dimensions of new STEM experiences are offered at the annual Symposium. Past events have featured keynote talks from world-leading scientists and science communicators including Prof Matthew L. Becker (Duke) 2024, Prof Fang Chen (UTS) 2023, Prof Robert Langer (MIT) and Prof Alyssa Goodman (Harvard) 2022, Dr Karl Kruszelnicki 2019. Students have been fascinated by the plethora of innovations in STEM and inspiration to enter STEM careers communicated to them by distinguished speakers and inspired the opportunity to present their ideas in a collaborative forum involving the invited guests as well as researchers and industry professionals.

In summary…

At our best we are better together as a team, and I couldn't be prouder of the work we have achieved over the last 5 years. We have all the right building blocks to continue to grow and work with more communities across the globe.

Prof Hala Zreiqat AM
Founder

Introducing our new Education Advisor

I joined BIOTech Futures at the end of 2023 and have been fortunate to oversee many areas of the program, including most recently leading our school outreach program and events with Fiona. As a science teacher this Challenge complements the evidence-based approach I apply throughout my work. I strongly believe that it's our people, our passion for building a better tomorrow and our willingness to act like a leader that is critical to our success.

I would like to thanks Hala for her support and significate contribution to making my onboarding an enjoyable one. I look forward to celebrating our program's rich 5-year history as we embark on the next chapter.

Dr Sunny Jeong
Education Advisor

How we work together

We are focused on ensuring all of our decisions and actions reinforce our purpose of creating better experiences together for a better tomorrow for our customers, team and the communities we serve.

Our strategic priorities

Our strategic priorities have a Student 1st, Team 1st approach at their core and align with our connect Group strategic framework:

Living our purpose and key message

Increased opportunities for students, teams and teachers to work together across schools, school systems, regions, states, and countries.

Increased access for mentors across disciplines and cultures to network and participate in STEM research and pursuits.

Delivering compelling propositions

To build collaboration, education and STEM expertise in Australian high school communities.

The program aims to attract international interest and research to NSW to encourage cultural and ethnic exchange in STEM, celebrating and building international context for school students and mentors across STEM fields.

Strengthening our foundations

To embed the Challenge into the school curriculum or programming in a way that provides greater support and access to students, teachers and schools. This also acknowledges key proficiencies needed for Australian Professional Standards for Teachers.

Our sustainability pillars

Sustainability is intrinsic to our program and the way we operate, helping us make positive change for a better tomorrow, and enabling the creation of sustainable growth.

People

Our People pillar focuses on creating a diverse and inclusive place for our teams to collaborate and work. It means supporting our communities, building partnerships and providing access, tools and events to different groups to support their unique needs.

Planet

Our Planet pillar focuses on protecting the world we live in for current and future generations. It means actively finding ways to create positive benefits and celebrating teams' innovative ideas in this field.

Product

Our Product pillar focuses on evolving the way we manage our program to embrace circular thinking, which means making our events more resource efficient and that all waste is a resource. It means creating e-learning platforms and online or hybrid activities.

Our stakeholders

As one of Australia's largest high school STEM Challenge programs, we recognise the impact BIOTech Futures has across all our stakeholders. Engaging with our stakeholders helps us to understand and prioritise our strategic agenda for the program to deliver sustainable value for all.

Teams | Institutions | Communities | Planet | Sponsors

For more information about our Priority Areas we are addressing, see page 12 and 13

Our value chain

Sustainability in Education

The importance of teaching sustainability practices in schools is fundamental to giving shape to education for a sustainable future

Diversity and Inclusiveness

Recognition of student diversity. Providing access, tools and events to different groups to support their unique needs.

Schools and School Systems

Strong and collaborative relationships with schools, and school systems is essential to delivering quality initiatives and value.

Incurricular Integration

Embedding the challenge into the school curriculum in a way that provides greater support and access to students, teachers and schools.

Our approach

Viable and resilient systems

We continue our long-standing commitment to contribute to a 1.5°C pathway and this year we have reviewed and obtained validation of our approach. This requires a collaborative and systems-based approach across the program and our value chain. We have implemented sustainability as one of our key themes for 2024 and prioritised it as a project theme for students while also including a number of mentors who are experts in this area.

Diversity across the chain

BIOTech Futures embraces the diversity of the places our teams and students participate and the type of work they do, and promotes individual and collective ownership along with the commitment we have as a program for ensuring everyone feels a sense of inclusion. Addressing gender and social inequality in STEM has been a key focal point in our 2024 outreach model and supported by committee and participant diversity.

Teachers focus groups

We have established a special interest group for teachers to get involved in the design and development of the Challenge. This has been established in conjunction with our education advisors who engage with schools throughout the year. Cross-cultural collaboration has been a dominant focus in 2024, increasing opportunities for students, teams and teachers to work together across schools, school systems, regions, states, and countries.

Key teaching proficiencies

Embedding the Challenge in the classroom has been a crucial initiative in supporting schools engaging in STEM outreach. It gives students an easier entry point to learn and become hand's on with STEM. Importantly it acknowledges key proficiencies needed for Australian Professional Standards for Teachers such that teachers can use this as part of formal accreditation in overall skill, performance and behavioural measures.

BIOTech Futures value chain reveals interconnected collaborations which continue to evolve to become more efficient to generate growth for our participant, mentors, teachers and schools, and to deliver on our commitment for a better tomorrow.

Interactive Workshops

Providing interactive hands-on workshops and up-skill events to reform and refine the way we approach STEM for high school students.

World-class Mentors

Our mentors are critical in supporting students and providing great experiences while maintaining an inclusive learning space.

Institutions and Industry

By partnering with intuitions and industry members around the world we connect students and shape the biotech landscape.

Education Stewardship

Emphasising the opportunity and impact for value exchange up and down our chain contributing to holistic net positive change.

Bringing STEM to life

BIOTech Futures realise the importance of stimulating ideas and creativity when approaching STEM. There is no better way to meet STEM for the first time than up close and hands-on. Interactive mentor stalls have been a great way of inspiring students by showing frontiers in innovation and STEM research in a way that's approachable and welcoming.

Mentor upskilling and development

Supporting and equipping mentors with the tools they need to positively impact students has always been the centre of our attention. In 2024 we looked for ways of doing this. Deploying Chronus mentoring this year was a bold step in doing this better, with mentor onboarding resources and modules as well as more connection to the committee.

Importance of networks

Partnerships and sponsorships are essential in driving broad social and cultural connection and change. This year we doubled our efforts in working closer with the University of Sydney and Engineering Faculty to support Challenge resourcing and funding which enabled us to showcase the Symposium at the Sibyl Centre and access more well qualified mentors.

Holistic and responsible progress

In 2024 it was through active involvement in each of value chain links that we could provide holistic and responsible progress to shape the social and cultural perspectives of STEM for students, mentors and associates and better support and embolden schools, institutions and industry which each stakeholder interfaces with during the Challenge.

Delivering value in regional areas

Community

Students and schools are at the heart of our strategy; by continuing to support and work with those in regional and remote areas of Australia, we want more Australian students across diverse areas to have access to STEM and discover what is possible to achieve.

Community Engagement

BIOTech Futures actively fosters a spirit of innovation and collaboration among students, mentors, and professionals in the biotechnology field. By creating platforms for young minds to address real-world challenges, the initiative empowers participants to develop solutions that have tangible societal impacts. Through workshops, mentoring sessions and the Symposium, BIOTech Futures encourages interdisciplinary approaches, uniting expertise from STEM and entrepreneurship. These efforts inspire participants to think beyond the lab, aiming to address global and local community needs, from healthcare accessibility to environmental sustainability. Our commitment to community extends to diverse groups, fostering inclusion and encouraging individuals from all backgrounds to contribute to the future of biotechnology.

Regional and Rural Outreach

Recognising the need to bridge the gap in STEM opportunities, BIOTech Futures prioritises outreach to regional and rural communities. By partnering with schools and organisations in these areas, we deliver tailored workshops, virtual mentorship, and resources that inspire young innovators. Initiatives include engaging students with cutting-edge technology and addressing barriers such as access to equipment or mentors. Regional participants are supported in joining the annual BIOTech Futures Challenge, giving them a platform to share ideas alongside peers from metropolitan areas. By empowering these communities, BIOTech Futures ensures that all students, regardless of location, have a voice in shaping the biotechnology landscape.

At BIOTech Futures, we are committed to nurturing the next generation of scientists, researchers, and innovators. Together with your support and our collective passion for biotechnology, we can unlock the doors to a brighter and healthier world.

Mentors

Supporting the mentors we work so closely with is essential to the long-term sustainability and success of the BIOTech Futures Challenge. We want to have a positive impact on all mentors we collaborate with through our community and network.

Positive impact today and every day

Exceptional mentors form the backbone of the BIOTech Futures Challenge, bringing a diverse range of expertise, from seasoned post-docs to thesis students on the cusp of graduation, and professionals from our esteemed industry partners. To fortify capabilities of these mentors in the BIOTech Futures Challenge, this year we focused on providing a series of workshops, social nights and events to support and uplift them.

The initiative kicked off with an information session where mentors engaged with an interactive presentation, learning about the program, their role, and crucially, developing essential mentor skills to effectively guide their assigned groups.

We also held a food and drinks evening marking the commencement of the Challenge and forming lasting networks for our mentors, offering a place for connections and collaboration across various backgrounds, educational levels and disciplines.

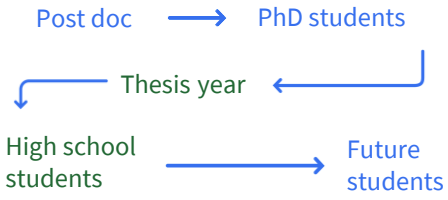
In a subsequent session, centred on the theme "How to be a Good Mentor" lead by our mentor outreach team and guest presenter Pascale Bridge from Abbott Diabetes Care, mentors delved deep into the intricacies of mentorship, explored the requisite skills, were equipped with mentor handbooks and other work activity tools, and learned what to expect from diverse groups of high school students during a role play session. The event not only allowed mentors to hone their skills but also provided a simulated environment for practical mentoring, with valuable feedback from seasoned mentors enhancing the learning experience.

The overarching goal is to ensure our mentors are exceptionally well-prepared to make a positive impact in the dynamic field of STEM–today and every day.

Future Thinking

Eager to enhance our mentor preparation processes, we anticipate the introduction of a mentor evaluation system and the launch of a self-paced online training module for mentors along with more tailored support. This initiative aims to guarantee the readiness and high quality of mentors who engage with our Challenge participants.

We encourage and facilitate a value chain of mentoring. We've now seen thesis and participating high school students form a source of mentors as part of future Challenges.



BIOTech Futures performance

The 2024 outcomes reflects a successful year for the challenge brought on by new process and technology improvements, better mentor-student collaboration and a wider range of projects and skill-based workshops for students and supporting staff to get involved with

We asked each students before and after the Challenge to rank questions from 1-10 in level of agreeableness. Here are their responses.

I find STEM appealing

9.2

▲ 8.2% from pre-Challenge

In 2024 this question score increased by 8.2% over the year which is an improvement from the previous year of 6.5%.

I find STEM achievable

8.7

▲ 4.8% from pre-Challenge

In 2024 this question score increased by 4.8% over the year which is an improvement from the previous year of 4.3%.

I am considering pursing a STEM degree at university

9.5

▲ 5.6% from pre-Challenge

In 2024 this question score increased by 5.6% over the year which is an improvement from the previous year of 5.5%.

A career in STEM seems appealing

9.5

▲ 6.7% from pre-Challenge

In 2024 this question score increased by 6.7% over the year which is an improvement from the previous year of 6.2%.

Public

Operating context

It is important that we understand and respond to the key macro trends that create both opportunities and risk for the Challenge.

School sentiment

School sentiment in Australia has been weak for some time, in line with rise in staff shortage pressure since February 2021[1]. This was driven at the time by COVID-related education system shocks and political tension with stagnant domestic investment and spending cuts to public education and literary. According to data from OECD[2], funding to public education was cut by nearly 2% from 2019 to 2020.

More broadly, there is also increasing polarisation of community views on the role business should play in addressing social and environmental issues.

As a proactive measure, a BIOTech Futures teacher and school focused task force has been prioritised to listen, learn and act on advice from key stakeholders within the education systems.

A 42% shortfall in the number of casual teachers has led to almost 10,000 lessons suffering everyday

[1]NSW Education "Impact of teacher shortages in NSW public schools" – October 2023
[2]OECD's at a glance report – July 2020

OUR RESPONSE

Helping schools and teachers find value:

- Teachers focus group
- Additional education advisor to the committee
- Teacher and parent online portal and support contact
- Increased number of opportunities and access to outreach workshops and in-Challenge workshops

Further information can be found on page 20

New technology and AI

The rise of new technology and artificial technology (AI) is transforming the Challenge. As a group, we are continuing to leverage data, technology and analytics to enhance our decision making, drive productivity improvements and optimise our internal processes.

Stakeholder preferences, including the growth in eLearning and shift towards greater convenience, has also given rise to new technologies and digital tools to improve participant experience. Internally, the adoption of digital technology has accelerated during the year to deliver greater value for the team.

Launch of Chronus digital mentoring platform

OUR RESPONSE

Leveraging technology and AI to optimise efficiencies:

- Enhanced participant digital tools and in-Challenge features
- Established a core group to accelerate our AI capabilities across the program
- Digitised our marking and event system to optimise systems and reduce time

Symposium

Attendance

235

▲ 10% from 2023

Mentor Stalls

8

▲ 10% from 2023

Schools Attending

8

▼ 12% from 2023

Symposium Review

On October 14th, 2024, The University of Sydney Sibyl Centre played host to a gathering of over 200 students, parents, and teachers at the annual BIOTech Futures Symposium. The event featured 23 finalist teams from across Australia, including winning teams hailing from the Queensland and Victorian challenges.

A Triumph of Innovation and Ingenuity

The BIOTech Futures Symposium was a celebration of innovation and collaboration, featuring guest speakers, including the Dean of Engineering at the University of Sydney, who emphasised the transformative potential of interdisciplinary research.

High school students presented their creative solutions to global challenges through engaging presentations and posters, showcasing advancements in fields such as biomedical engineering, sustainability, and AI. Attendees gained valuable insights from keynote speeches and expert panels, while the event fostered connections between students, mentors, and industry professionals. The Symposium concluded with awards recognising outstanding projects, leaving participants inspired to pursue impactful careers in biotechnology and engineering.

“The Symposium allowed me to be creative and propose a solution to a problem that was personal to me, and I got to meet a lot of new people along the way” said one student.

The top honours of the day went to Emily Chen, Stephanie Grainger, Joshua Ng, Emily Pang mentored by Dakota Kedzier-Hurst for their exceptional project, “OASIS” an oil absorbent sea inspection system, capturing the judges' attention with its innovation and impact.

The Symposium also included a riveting science fair where all teams presented their posters to a panel of academics. Zara Perkins, Isabelle Rath-Mazzochi, Natalie Assaad, Jess Weatherall, Melody Li, mentored by Ankit Kapoor, secured the best poster presentation for their project, “AstroJab”.

Beyond presentations, students engaged with mentors and sponsors at the science fair, exploring VR goggles, operating robotic arms, and even designing and building robotic hands themselves.

The Symposium was a massive success, and we look forward to our next events in 2025.

Prize	Team	Region	Project
Overall Winner	BTF55	NSW	OASIS
Overall Runner-up	QLD02	QLD	Serum Switch
Best Prototype	VIC01	VIC	smartHive
Best Report	BTF44	NSW	Solar Power
Best Poster	BTF59	NSW	Astrojab
Workshop Winners	BTF20	NSW	Buddy Band
	BTF55	NSW	OASIS

Hands-on science and technology

The Symposium included a hands-on workshop where students built hand-powered paper centrifuges, the “paperfuge” which in a real-world context could be used to separate blood components in less than 2 minutes.

The hand-powered device highlighted how creative design can be used to make diagnostic tools for use in global settings with limited resources.

Overall 2024 Challenge Winners

Pictured is the winning student team from William Clarke College with their project “OASIS”, an oil absorbent sea inspection system used to monitor the quality of waterways and provide solutions for clean drinking water. Congratulations to the team for an amazing presentation.

Skill Based Workshops

Workshops during the Challenge

Throughout the Challenge as teams were diligently working to gather resources, perform experiments, and justify their research, a variety of online skills-based workshops were hosted by members of the BIOTech Futures committee. These workshops were immensely popular, and provided additional value to not only students, but also teachers, supervisors, and mentors who joined us for the online sessions.

To initiate the exciting journey of exploration, especially for our younger participants who are enthusiastic about STEM, we organised a comprehensive workshop on scientific research and referencing best practice. This session was expertly conducted by Dr Matilda Longfield, a Postdoctoral Researcher and Hospital Scientist at Royal North Shore Hospital. The workshop aimed to empower students with essential skills and knowledge as how they can conduct professional evidence-based research and citations for their projects while also providing a solid foundation for their academic pursuits.

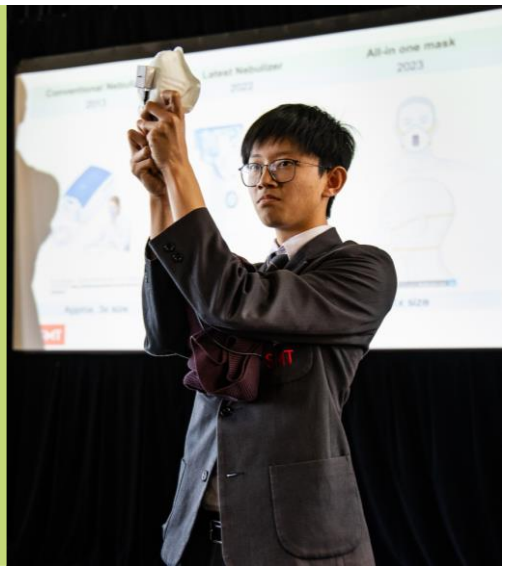
As the Challenge entered its final weeks, participants were treated to a valuable session led by Kate Pickard, a PhD student at the University of Sydney studying health. The session was specifically designed as a crash course, delving into how to create a scientific poster. Kate's expertise in the field and her commitment to advancing scientific communication made her the perfect guide for this crucial aspect of the Challenge.

High School Outreach Workshop

The High School Outreach Workshop took place on 11 June and involved 150+ students, teachers and parents from around Sydney. The workshop provided an engaging, hands-on experiences for students as they collaborated in interschool teams to tackle real-world challenges. Participants brainstormed creative solutions and constructed DIY prototypes using accessible materials to bring their ideas to life. With guidance from University of Sydney mentors, students explored design principles and problem-solving techniques while developing innovative concepts. This collaborative environment encouraged cross-school interaction and team-work, as students shared diverse perspectives and refined their prototypes. By the end of the workshop, participants had a tangible starting point for their projects, equipping them with confidence and skills to progress further into the BIOTech Futures Challenge

Delivering value to students

The combined impact of these workshops signals a future direction focused on practical, interactive, and hands-on learning experiences, fostering a culture of skill development that extends beyond traditional academic boundaries in and out of the Challenge itself. The emphasis on real-world application stands as a guidepost for shaping workshops that empower participants with tangible skills, preparing them for success both in academic and professional pursuits. We will continue working with our network and school systems to champion STEM learning for students across the regions we work.



Way forward in 2025 and Next Steps

Below is an overview of BIOTech Futures Future Horizon Thinking and Next Steps as we build into the next iteration of the Challenge. This strategically aligns with our Priority Areas highlighted on page 12 and 13 of this report. These next steps include increasing our global presence, continuing to improve collaboration and work with schools and mentors, and commitment to promote and ensure access of the Challenge in rural and remote regions while celebrating the strong diversity we now see in STEM.

EXPANDING GLOBAL PRESENCE

Collaborating with the Society for Advancement of Science and Technology in the Arab World (SASTA) as part of a global effort to install successful satellite challenges around the world.

Continuing to work with institutions and schools across Australia, New Zealand, Europe, America and the Middle East through our teacher focus group initiative and extensive outreach programs. We are keen to continue demonstrating the potential for students and mentors to work across borders and systems.

COMMITMENT TO FOSTER DIVERSITY

Building on a successful year with regional and rural outreach with our ASE partner, we are looking to provide more opportunities for students and teachers in those regions, listen to their needs, and demonstrating a willingness to learn and grow with these school systems.

This year we saw the potential for aligning the Challenge within the school programming with 8+ schools adopting this strategy. We're keen to continue working with schools in NSW to allow access for students to participate in the Challenge as either extra- and in-curricular school programs.

Our pathway towards increased STEM participation

What we've achieved so far:

- 78 schools and 38 institutions across Australia and internationally having participated in our value chain program.
- Cross-section collaboration between different groups of students, teachers and mentors.
- Active participation in delivery STEM initiatives to remote and First Nations communities.

Near-term

Viable and resilient systems

Increased STEM participation focuses on supporting viable and resilient systems with actions to enhance value chain inclusion in the near and long-term. This will be delivered through collaboration, education, innovation, investment and advocacy.

55%
40%

New targets:

Increased student participation by 2026

Increased school institution participation by 2026

Trajectory reflecting increased growth

We are here

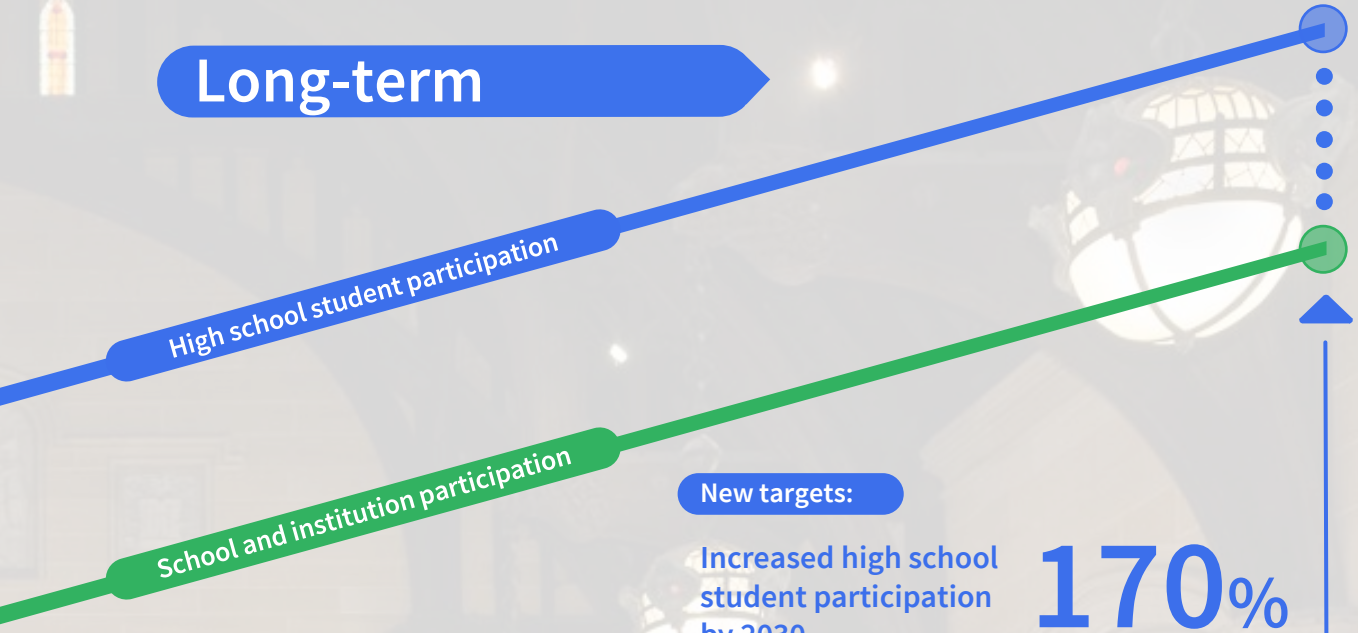
New base year: 2024
Previous base year: 2019

Our ongoing efforts:

- Strengthening partnership with the University of Sydney Faculty of Engineering, working with the Hackathon and 'Coding Fest' programs.
- Increase STEM reach to students who have reduced access, including rural and remote areas by developing partnerships with sector Leaders.
- Expanding program scope to reach more diverse students and expertise of mentors, partnering with Australian learned academies.

2019 2021 2025 2026

Long-term



New targets:

Increased high school student participation by 2030 **170%**

Increased school institution participation by 2030 **120%**

Our STEM participation aspiration

We aim to achieve STEM participation across our value chain. We will partner on opportunities for inclusion and growth whilst working on innovative solutions. As this landscape evolves, we will invest in new technologies, encourage sustainable practices and implement data-driven solutions to enhance the viability and resilience of our systems to uplift STEM and STEM engagement to the community.

Focus areas:

- Progress sustainable targets and approaches that support resilient student-led initiatives and programs to encourage STEM engagement.
- Continue to identify and invest in scalable tech-based solutions that provide community and social benefit to all members of the program.
- Continue engagement and advocacy with government, industry and broader stakeholders to share knowledge, capabilities, and focus collective efforts.

BIOTech Futures' approach is to drive participation of STEM across our value chain in partnership with our sponsors. This year, we updated our scopes near and long-term targets, towards our ambition of 1000 students across 55 schools participating in the Challenge each year from all geographies and backgrounds by 2030. Our pathway applies an evidence-based approach, and our scope is split evenly between student led initiative, technology solutions, and listening and responding to leaders and authorities in each sector we are involved with.

2027 2028 2029 2030

Governance

Below is our governance for 2024. Our purpose of creating world-class experiences together for a brighter tomorrow guides us to better meet the needs of our teams, students, and other key stakeholders. BIOTech Futures is committed to a high standard of governance. Good governance goes beyond legal compliance; we see it as central to our approach to creating sustainable growth and enhancing long-term stakeholder value.

Founder & Chair	Professor Hala Zreiqat AM
Academic Liaison	Dr Jiao Jiao Li
Chairs	Joshua Aarons & William Nixon
Education Advisors	Fiona McCrossin & Dr Sunny Jeong
Advisor	Yohaann Ghosh (Inaugural Chair)
Outreach Officers	Tasneem Rahman & Rourke Barlow
Event Organisers	Dominica Leaver (2022/23 Chair) & Frank Fei
Satellite Heads	Rosa Armitage, Luke Hipwood, Victoria Li
Advisory	Professor Ali Abbas on behalf of the University of Sydney Faculty of Engineering

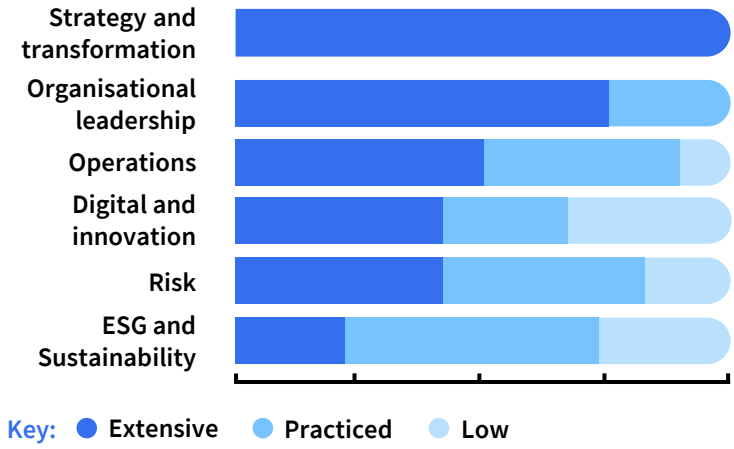
Committee capability, composition and tenure

The Committee is composed of a majority of independent research and industry professionals with the skills and capabilities to fulfil their duty to act in the best interests of BIOTech Futures. The effective application of those skills and capabilities enables the Committee's contribution to the decision making and governance of BIOTech Futures. The Committee is comprised of individuals with both relevant skills and capabilities, and diversity of thinking. When combined with management, this leads to BIOTech Futures fulfilling its potential through living its purpose, observing its values and executing its strategy.

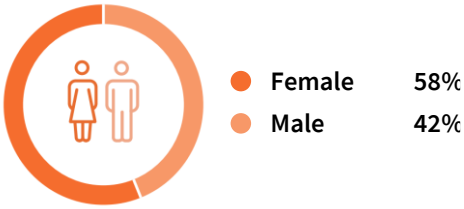
As part of the ongoing succession planning for the Committee, we reviewed the Committee capability matrix, which took into consideration the skills and capabilities that the Committee currently requires, together with those needed in the future. An assessment of the optimum mix of these capabilities takes place at least once a year. This also informs the identification and assessment of suitable future candidates for the Committee.

A summary of the key skills and capabilities of Committee members is set out below

Capability



Committee gender diversity



Committee tenure

Strategy and Transformation: Identifying and critically assessing strategic opportunities and threats and associated business plans; overseeing successful transformation execution in large, complex organisations to create and sustain, resilient outcomes.

Organisational leadership (including people): Developing and assessing organisational structures and culture and its adherence to BIOTech Futures core values; people management and succession planning; setting strategy-linked remuneration frameworks; and promoting inclusion and belonging.

Operations (including supply chain): Overseeing physical and digital operations in large, complex organisations.

Digital and Innovation: Evaluating and implementing new digital and physical technologies, including in-depth understanding of the use of data and data analytics to continue to accelerate business transformation and meet evolving customer needs and expectations.

Risk: Anticipating, identifying and managing key risks, including financial, non-financial and emerging risks; monitoring the appropriateness and effectiveness of risk management frameworks and controls.

ESG: Developing and overseeing environmental sustainability and governance initiatives and strategies, including climate change, nature, carbon emissions reduction, human rights and responsible sourcing.

Testimonials

NSW Women's Week

"As year 10 students from a rural school, it is not often that we are presented with opportunities as freely as those students in the city and to find out that a Sydney University had invited us was incredibly encouraging for us all. Personally, the section of the day that I enjoyed the most was the presentations by the professors. They were engaging and were an enjoyable way for us to learn more about fields of biology that I would have otherwise been unaware of." Sarah Waters, PLC Armidale, March 2020

International Collaboration

"Overall, this experience has affected us dramatically, as now going back into school and moving into more complex chapters, for example biology, I am much more aware of what's going on due to the practical experiences I had." Mamoun Khasawneh - International Academy Amman, Jordan, February 2020

Trip to Murrumbidgee Regional High School

"Personally, I knew that I enjoyed science however wasn't exactly sure where it could take me. After today, I feel I would really enjoy working with collaborative and creative people who share their love for science as me." David Mills, Barellan Central, April 2023

2024 Symposium

"Met with team members and our mentor every week and became friends with girls from different grads at my school."

"I have now gained experience reading formal scientific articles and journals, and in presenting my work and research."

"Looking forward to signing up next year to compete again!"

Sponsors, Partners & Affiliates in 2024

Platinum Sponsors

The University of Sydney: Office of the Vice Chancellor

The University of Sydney: Faculty of Engineering

Gold Sponsors

The University of Sydney: Musculoskeletal Health

The University of Sydney: Charles Perkins Centre

Silver Sponsors

The University of Sydney: Sydney Nanoscience

The University of Sydney: Faculty of Science

Partners

Joint Biomechanics Training Centre

Melbourne Bioinnovation Student Initiative

Judges

Luke Hipwood

Associate Professor Khoon Lim

Associate Professor Jelena Rnjak-Kovacina

Dr Giselle Yeo

Speakers

Professor Annamarie Jagose – Provost and Deputy Vice Chancellor of The University of Sydney

Professor Hesham El Gamal – Dean of Engineering at The University of Sydney

Professor Matthew L. Becker – Distinguished Professor of Chemistry at Duke University

Dr Lucy Buxton – Board of Directors at Ocean Decade Australia

Dr Don Perugini – Co-Founder and CSO of Presagen

Professor Annamarie Jagose speaking at the 2024 Symposium

Professor Hesham El Gamal speaking at the 2024 Symposium

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Five Year Summary
The Five-Year Summary is available on the BIOTech Futures website.

BIOTECH FUTURES
CHALLENGE