THE SINGAPORE INSTITUTE OF BIOLOGY

BULLETIN

AN OUTSTANDING PERFORMANCE! 34TH INTERNATIONAL BIOLOGY OLYMPIAD IN UNITED ARAB EMIRATES

EXPOSING YOUTHS TO WILDLIFE! SJBO 2023 AT MANDAI ZOO

SIBIOL PUBLIC FORUM 2023: AQUACULTURE AND FOOD SECURITY

A MESSAGE FROM THE PRESIDENT

Dr Theresa Su
President, 50th Council
The Singapore Institute of Biology

Dear Friends,

I greet you with great excitement as we embark on our 50th year together as a community in Biology. As we commemorate our jubilee year, we recall the mission of the SIBiol: to promote the advancement of Biology and its applications, improve Biology education, and aid the exchange and sharing of ideas to those interested in biological studies. As we recollect 2023, please allow me to highlight and celebrate some of SIBiol's achievements at the international, regional and local scenes.

Team Singapore delivered an outstanding performance at the 34th International Biology Olympiad (IBO) in United Arab Emirates. The team brought home four Gold medals, with rankings that have placed Singapore first out of the 76 participating countries and 293 participants. Read about the journey and the reflections of our national representatives on the following pages of this bulletin!

Locally, the 8th Singapore Junior Biology Olympiad (SJBO), jointly organised by SIBiol and Science Centre Singapore, had yet another successful run. The highest ever level of participation was recorded— a total of 2,347 students from over 93 local schools participated in SJBO 2023! For the Practical Round, SIBiol partnered the Mandai Zoo and competitors from seven schools were exposed to a variety of real-world questions which further facilitated learning during the competition itself. The tasks ranged from skull morphology, investigating pathology, to exhibit design! Positive feedback were received from both the participants and their teachers on the novelty of this authentic learning experience. At the end of the competition, the teams were brought on a behind-the-scenes tour, a treat from the team at the Mandai Zoo!

A Message from the President

In addition to our annual student awards at the Institutes of Higher Learning, SIBiol further supported three scientific conferences: the Asia Pacific Coral Reef Symposium 2023 and the International Postgraduate Conference on Biotechnology 2023 in Singapore and the Biological Sciences Graduate Congress 2023 in Malaysia. The society will continue to explore meaningful opportunities to support the exchange and sharing of biological research.

Lastly, SIBiol is delighted to restart the call for proposals for the SIBiol Research Trust Fund in 2023. The received applications have undergone review by the SIBiol RTF scientific panel and successful applicants will be notified shortly.

On behalf of the 50th SIBiol Council (Year 2023/2024), I thank all members, new and existing, for your continual support. I extend my gratitude to all Council members, especially Vice-President Ms Charlene Goh, Immediate Past-President Dr Nicholas Yap, Honorary Secretary Dr Toh Tai Chong, Honorary Treasurer Dr Cynthia Wong, Assistant Honorary Treasurer Ms Joleen Chan, Council members Dr Adrian Elangovan, Dr Savita Sharma, Dr Chen Zhong, Dr Abigayle Ng, Dr Jani Tanzil, and SIBiol interns (outgoing: Ms Loy Jing Si and Ms Jolene Ang; incoming: Ms Alicia Jocelyn Tjokro, Ms Lim Le Xuan, Ms Wang Yuting and Mr Timothy Leong). Your collective dedication and commitment to our cause is a powerful inspiration.

A great thank you to our mentors, especially Assoc Prof Lim Tit Meng (NUS DBS; SCS; SNAS), Assoc Prof Melissa Fullwood (NTU SBS), Dr Beverly Goh (NTU NIE), Dr Tan Lik Tong (NTU NIE), Asst Prof Tan Yong Zi (NUS DBS), Ms Emelyne Quek (MOE) and Mr Foo Yongkuan (MOE) — all of whom are essential in providing assistance, guidance and leading the team. A special shoutout to the alumni, trainers, lab executives, teachers and parents for being the supportive ecosystem.

We extend our sincere appreciation to the Ministry of Education, National University of Singapore (Department of Biological Sciences, Lee Kong Chian Natural History Museum), Nanyang Technological Institute (National Institute of Education, School of Biological Sciences), Science Centre Singapore, St John's Island National Marine Laboratory, and Mandai Wildlife Reserve, for without which our endeavours would not be fruitful. For the community at the Singapore National Academy of Sciences (SNAS), thank you for the opportunities to participate in scientific conversations both nationally and internationally. With hope, we look towards a future of fruition and meaning in the coming years!

Dr Theresa Su
President, 50th Council

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34th International Biology Olympiad

By: Alicia Jocelyn Tjokro, Wang Yuting, Lim Le Xuan, Debraath Pahari, Soh Sze Hian Lionel and Lai Le Hao Jerome

The United Arab Emirates (UAE) is a country located in the Middle East with a population of more than 9 million. Formed from seven emirates, the country's main source of income is tourism and oil. This year's IBO was co-hosted by the UAE's Ministry of Education and the UAE University in Al Ain, the country's first comprehensive federal university that was founded by the first president, bin Sultan Al Nahyan, in 1976. The 34th IBO was also record-breaking, with the highest-ever attendance recorded of 75 participating countries.

Nevertheless, Team Singapore did the country proud by ranking 1st after 7 years, with all four students clinching gold medals! This was only possible due to the tireless hours spent by the jury checking the questions in the papers and ensuring fair marking for our students, comprising Mr Foo Yong Kuan (MOE), Dr Beverly Goh (NIE), Prof Chen Zhong (NIE) and Ms Loy Jing Si (SIBiol). Both students and jury members also got to unwind by going on excursions to other attractions in Dubai and Abu Dhabi, such as the Burj Khalifa and the Grand Mosque.

UAE University, the site of the competition

The jury team from Singapore

The jury team and fellow alumnus Lucas Yeo (leftmost) posing with the Singapore team

THOUGHTS FROM THE TEAM

By Lim Le Xuan (ranked 14th)

If I had told my past self a year ago that I would have the honour of representing my country at IBO and achieve a gold medal, I cannot even imagine how stunned she would have been. Knowing now the countless challenges and difficulties I would encounter along the way, she would have found it hard to believe that we are the same person. The journey I undertook to reach this point has been filled with countless ups and downs, moments of doubt, and relentless hard work.

Reflecting on this journey, I can still recognize glimpses of that younger version of myself in who I am today. Many traits of mine have not changed throughout the path to the Olympiad, such as my passion for biology, especially when it comes to biodiversity.

Picking up a Tailless Line-blue for good luck the day before departure

My growth throughout the IBO experience can be seen through the lens of my interest in butterfly photography. This interest developed about a year ago, as I began learning more about conservation issues in Singapore along with nature photography. In particular, I was intrigued by both the great diversity of butterflies that could be found in Singapore, and yet the mysteries that still surround this well-studied arthropod group.

Similarly, throughout my IBO training, I had the privilege of meeting various professors and learning from previous IBO participants who generously shared their knowledge in their respective fields. Exploring the diverse forms, functions, and behaviours of organisms is awe-inspiring and has deepened my appreciation for the beauty and diversity of life. Despite the dynamic and ever-expanding nature of biology, it continues to be a realm of perpetual mystery. Every day, as new discoveries are made and questions are answered, there are even more hypotheses that are generated, eager to be tested.

While many aspects of my journey have remained constant, the IBO experience has undeniably changed me in other ways. The skills I have honed and the qualities I have developed have not only aided me in my academic pursuits but also enriched my nature photography hobby. My intuition has sharpened through the numerous practice papers I have done, enabling me not only to grasp biological concepts more effectively but also to understand butterfly behaviour and how to best approach and photograph them. Moreover,

A lesson in genetics with Dr Wu Jinlu, one of my most respected professors! This training session reminded me of why I enjoyed his lessons so much and I even got a chance to reconnect with him after completing his LSM2105 module in the previous year

the demanding training for the IBO has instilled in me a sense of discipline, which is an essential attribute in butterfly photography, which demands extensive time and effort spent in the field to observe the charismatic insects.

Additionally, I have learnt the value of patience, allowing me to delve into complex biological concepts and break down complex problems. Patience is important in capturing photographs of butterflies as they are skittish and fast in flight, thus calling for ample time and perseverance to observe them.

Now that my IBO journey has come to a close, I realise that my path in the field of biology is far from reaching its end. If anything, the experience has made me realise how much more there is to discover and explore within the realm of biology. Going to IBO exposed me to a community of so many young, like-minded, aspiring biologists from around the world. It was an incredible opportunity to exchange ideas and form lasting friendships with participants who shared my passion for biology.

I met Jieoh (top left) from Germany (Hi Jieoh if you are reading this, you're very awesome :D) and it turns out, we were literally 2 weeks apart from meeting each other in Gottingen. She was there because Germany trains for IBO at the Max Planck Institute and I was there for an overseas academic programme at XLAB, both buildings were 150m apart.

I had the honour of meeting so many friends from many different countries and it's so nice seeing how we can click with each other! (if you're reading this, hi Yu Han, Heewon, Rita, Nakeisha and Marina, I miss you all! And thank you for being a wonderful roommate Moomena! Shoutout to the Hong Kong team + Calvin, you guys are such a fun group!)

In conclusion, I would like to express my gratitude to my teachers and seniors for their support and guidance. Their dedicated teachings have played an important role in my journey. I would also like to extend my appreciation to my parents for their unwavering belief in me. I am also grateful to Zick and Yufei, whose guidance has helped me navigate the world of butterflies, as well as supporting me in my IBO journey. I would also like to thank my friends from the training team for their words of encouragement. To my teammates, Jerome, Debraath and Lionel, thank you for being such a supportive and absolutely chaotic group of friends. Your presence made the IBO experience all the more memorable and fun. Finally, a special thanks to my senior, Aravindh, who has been the best mentor I could have asked for. Despite facing his own challenges, he still makes time to patiently answer my numerous and often demanding questions and always offered encouragement when I'm at my lows. His tenacity is my main inspiration.

If there's one piece of advice I could offer my younger self, it would be to have more confidence. I would tell her to stop worrying about what the future holds and trust in the skills and knowledge I have acquired. Even in the face of challenges that may arise, I would remind her that there will always be friends and family ready to offer their unwavering support. Armed with this newfound understanding, I am determined to keep pushing forward in my journey in the field of biology.

All of us anxiously waiting for the results to be announced, while my friends tuned in to the livestream and were giving their support

I sometimes think that my Biology Olympiad experience was less turbulent and hectic than others (for the record, I still have not fully read Campbell) but it was certainly still filled with occasional stressful moments. To any IBO wannabes who might be reading this, I hope you can achieve a result that you'll be happy with, but more importantly, I hope that the experience has helped you to identify your strengths and weaknesses outside the olympiad and grow as a person, such that you can look back on this journey with fond memories and a greater appreciation of who you are!

I would say that out of all of us, you are the truest bio nerd and seeing you name random butterflies that flew past us during Dr Adrian Loo's session with us through Thomson Nature Park was definitely fascinating. Your calm demeanour despite your jitters certainly helped us to calm our nerves before each IBO exam. Thanks for playing Tetris with me on the flight back :D

From Jerome

Le Xuan, you've been such a pillar of support throughout these past few months, and I am so thankful this opportunity was a way for us to get close, even though we already were classmates. Your knowledge of biodiversity is truly astounding and yes, I remember that the Chocolate Pansy is a butterfly! Thank you for this year, and I'm glad our covenant was honoured.

From Debraath

Thank you for helping me to bring comic relief to the team, as well as for listening to my endless rant about the practical exams before the competition. You are very knowledgeable about animals too, which motivated me to constantly update my repository of quirky facts about animals. Let me know if you're still up for the challenge to see who knows more about animals hehe…

From Lionel

THOUGHTS FROM THE TEAM

By Debraath Pahari (ranked 8th)

I first joined my school's Biology Olympiad programme in 2019 but now, I cannot remember what made me do so. At that time, I felt like math was no longer my strong suit, so maybe I wanted to try something new. I had been doing quite well in biology and I thought it would be an interesting experience.

It was! Feels quite funny to recall how I got only a participation in the first SJBO I took part in, back in Year 2. I felt rather disappointed by my performance then but looking back, I am glad I stayed the whole way through.

The school's modules had a wide variety of topics and sometimes the tests were really difficult… but it was one of the ways I got to meet many of my current friends, ones interested in biology as much as I was and some even more. Those four years feel like they went by fast, but I could argue that for my entire IBO journey as well.

The first ever field trip I had with my Biology Olympiad class back in Year 2

In Year 5 when SBO was drawing near, I promised myself to go and study a lot for it. However, that sort of fell through because of how packed our timetable was. Trying to juggle my commitments made me reconsider my priorities, and I had to ask myself why I had joined Biology Olympiad in the first place. It felt very draining then and at one point, I was contemplating dropping out.

My parents were very understanding throughout all this and they told me to never stretch myself too much. In the end, I decided to just pull through. I had just one more module left then I could at least say I committed to it for four years, which to me felt like an achievement by itself.

Our SBO was quite uneventful, the theory round went without a hitch but at the end of it, I felt quite empty. The results for those invited to the practical round also came at a rather odd time, when I was in one of the NUS LTs doing my finals. I remember opening my phone to many messages from different people and it took me quite some time to process that I had gotten through the first stage! The practical round at NIE was also interesting but I felt much worse than I had felt for theory. So, I convinced myself that whatever the result, I was proud I had at least made it to the practical round.

Practical Round for SBO 2022 with our lovely seniors!

A training session where we went to MacRitchie Reservoir with Dr Maxine Mowe, who also happened to be one of my NUS professors

To get Gold at SBO and be invited to the training team was something I did not expect. I do not think I ever had that much confidence in my abilities, and my friends hyped me up much more than I ever did myself. I would be lying if I said my entire Olympiad journey was a solo effort; all my friends were there to support me, to comfort me when I felt like I was not doing enough or when I felt down. For that, I could never thank them enough.

The training team itself introduced me to five others who were extremely knowledgeable yet fun-loving. Even though we were from different backgrounds, that did not hinder us from gelling together quite well. I had only known Jerome previously from a group interview; the rest were all people I had never met before. Oddly, Samuel and I found out we lived in the same HDB by coincidence on the way back from our first training. It then became a running joke how the two of us shared a flat (which we do not).

Trainings every Wednesday and Saturday were very interesting, covering so many domains and it was one of the ways I familiarised myself with the NUS Science buildings! I especially liked lessons with a practical component, such as sessions spent in the lab or when we went for learning journeys - trips to the LKCNHM or MacRitchie Reservoir. Those trips were extremely memorable and it was evident how much effort the professors put into training us. I would look forward to those training sessions, excited both to learn more and meet my training teammates! Those were a highlight of the entire Biology Olympiad journey.

When the news came, I was taken aback by my selection for the final team because I was not confident at all in how I was doing. After the announcement, I remember Dr Goh telling the four of us that we still had a lot to revise before going for IBO and that scared me slightly. On a lighter note, the dynamic I had with my teammates was something I was very happy about. Although we did not know each other well before getting selected as the final four (even Le Xuan!), I am thankful this opportunity allowed us four to bond together.

IBO itself was quite the experience. The opening ceremony was the first time I realised that 'oh… I am at the International Biology Olympiad'. Before that, I had not completely processed it. Through those 8 days, I got to meet so many people from different walks of life! My roommate Ali was from Saudi Arabia and he was really fun to be with. I also remember going over to Jerome's room and talking to his roommate Nawaf, and they were all such good sports that I reckon I miss the people quite a bit. However, we were the closest to the Hong Kong team and Calvin, an Indonesian competitor.

Over the three sightseeing days, I greatly enjoyed the trips organised by the committee. We visited the Sheikh Zayed Grand Mosque and the Louvre where I got to see my first-ever painting by Da Vinci! On our trip to Dubai, we got to see the famous Burj Khalifa and look around the shops in Dubai Mall. The only regret I have is not bringing my camera to the UAE and missing out on taking photos during our first two trips.

By the time it came to the closing ceremony, I was extremely nervous. I had had quite a few scares during IBO itself so I did not know what to expect. The way the medalists were slowly being announced was also very anxiety-inducing. When all the Silver medalists had been mentioned, nothing went through my mind. I was lagging out until Le Xuan grabbed me and started yelling and I yelled back and there was so much yelling that the participants around us just stared at us. I do not think any of us expected it since the last time Team Singapore had won 4 Gold medals was way back in 2016… On the other side, my Telegram was exploding with messages from friends who were watching the live stream.

My roommate Ali and I

Group photo with Team India, feat. Jing Si and Dr Chen Zhong :)

There is not much to say after that which you may not know. We got a Gold medal each and Singapore ranked first! To have started from desiring just an SBO Silver to having ranked 8th in the whole world is a jump I do not think I could have fathomed. To Year 5 Debraath who was contemplating dropping Biology Olympiad, I am thankful that he persevered.

On an ending note, I am extremely thankful for all the people who supported me or believed in me because there is no way whatever I did was an individual endeavour. To all the professors who came down to teach us this year, and to our lovely jury members (Dr Goh, Dr Chen, Jing Si and Mr Foo), a big thank you for your time and effort! We would not have gotten here without you.

To the teachers in NUS High who made me love this subject (Ms Renata, Ms Fong & Mrs Fernandez), to all the seniors whom I met at the camp or the BBQ (especially Aravindh, Trivi, Omkar and Lucas), to all my friends who believed in me when I didn't believe in myself (shout out to Alicia, who was by my side from Year 2 all the way to camp) and to my parents - all these people played a part in helping me reach such a milestone.

To my juniors, although there is glory and there is effort involved, please keep in mind that it will get stressful and tiring. I felt burnt out sometimes leading up to our selection camp and IBO too, but always keep in mind what made you join in the first place.

If you got to this point, I would give you a hug! Except, I'm probably not there so you can have a virtual one instead. I'm glad it happened, and I wouldn't ask for anything to change.

You are such an approachable person to chat with, and it's so easy to strike up a conversation with you! I really appreciate how you always listen to my jokes and do not let them fall flat! Nothing beats the satisfaction of seeing the smiles on your faces and hearing your laughter :) I am also grateful to you for reaffirming my beliefs about how the strength of a team lies in its unity.

From Lionel

Your strength has always been your chaos and determination which I appreciated more once I was on the receiving end of your teasing and jokes (and I think it has only resonated with my snark). Getting to know you made me realise the parallels in our journey, so to my former classmate and now friend, may your lively personality continue to brighten the days of those you care for!

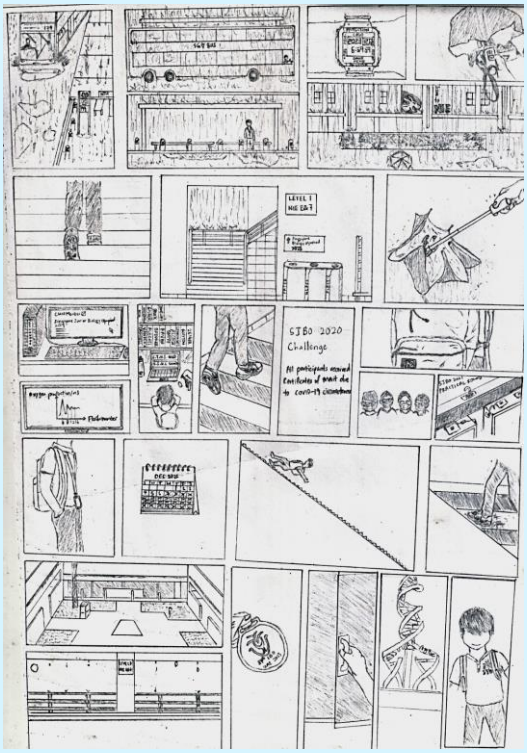
From Le Xuan

From meeting you first at an MOE award interview to being in the same SBO group to making it to the IBO team, it is amazing how our paths continued to intertwine. I'm glad that it happened this way, because I got to meet an amazing person, whose passion for learning across disciplines from sciences to the humanities is infectious and funny personality always brings a smile to my face.

From Jerome

THOUGHTS FROM THE TEAM

By Soh Sze Hian Lionel (ranked 9th)



Story Arc 1 - My IBO Journey

People. Passion. Principles.

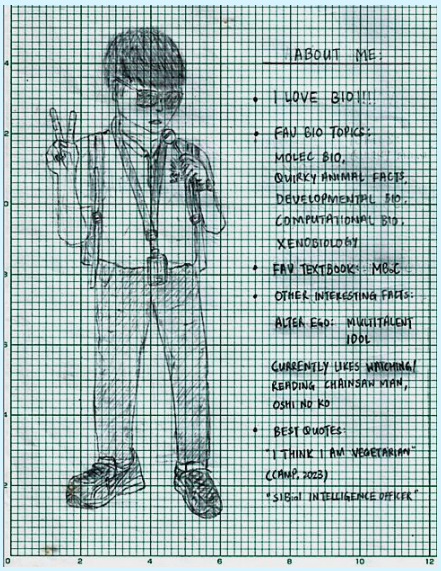
My Biology Olympiad journey began at the end of Year One as a quest to learn more about the natural world, whose awe-inspiring beauty I was heavily mesmerised by just like any other young child would after watching David Attenborough's nature documentaries (most notably Blue Planet II). Before then I was never really into Science Olympiads, but what made me embark on my decision to join SJBO the following year was the motivation to become the top scorer to prove that my dream – to win purely because of how much I love the subject – was the most deserving of all dreams. Thus began the battle of dreams.

My dream was only fulfilled two years later, but my experiences during those two years had been inval uable to my personal growth and in shaping me to become the person I am today.

The first senior I met was Dewey (in early 2019), when I was walking below Raja Block in RI and overheard someone talking about an IBO 2014 question on B cells. At that point in time, I knew that the top scorer of SJBO 2018 was this guy called Dewey, but having never seen his face before, it was sheer luck that it was actually him after I approached him and asked if he was the legend himself :P Being the first senior I met, I was deeply inspired by his passion about the subject and his commitment to helping his juniors, especially when he came all the way to the Y14 side from the Y56 campus to teach me despite him being in crutches :/

When I first attempted the Olympiad problems, it was extremely difficult to solve them under

the intense time pressure with the lengthy preambles, voluminous data and multistep reasoning involved. But ultimately, that is what makes Biology Olympiad undoubtedly the best Olympiad ever, by pushing you to break your limits, accomplish the impossible, and keep striving to do better. In so doing, the IBO spirit not only trains your intellectual prowess, but more importantly, it moulds your life philosophy. Furthermore, most of the questions do not require any advanced knowledge at all, but rather, they require your creativity, problem-solving skills and ability to cope under time pressure, making them exceedingly elegant.



About myself

Another key moment in my Biology Olympiad journey was in Y34, when I entered a class which helped me to re-examine my purpose of taking part in Biology Olympiad. My Y34 class was special; Not only were my classmates exceptionally talented in their various subjects of expertise (and several of whom would later on become International Olympiad medallists), they were also extremely supportive of one another. This had a huge influence not just on my perspective regarding my Olympiad journey, but also on my life principles: Winning is not just for myself; It is for all of my friends who have always been there for me at every step of the way. When it comes to the Olympiads, it is true that many people have concerns about freely discussing with one another, for fear that they might give their rivals an edge, or that it would spur their competitors to mug even harder, and this has become the so-called "normal" Olympiad mindset for many. Fair enough. But in a society where so many people conceal their true motives behind a façade in an effort to win the rat race to the extent that such actions have become the norm and genuine interactions have become increasingly rare, perhaps normal is indeed just a raging psychopath. Life is not a zero-sum game, so why don't we win together instead?

Then came Y56. I fell hard. To be honest, I have never truly gotten back up, but I am incredibly grateful that my dream for six years still came true and I made it to the IBO in the end. I still vividly remember how after the SBO practical round, I was absolutely devastated as I had messed up one of the practicals, and I essentially wasted my entire December holidays moping around doing nothing. When the results were announced the next year, I was extremely surprised and elated that I had gotten a gold medal (I shouted in joy so loud during CCA that the whole block probably heard me :o), but I was already rusty and it was challenging for me to catch up. Looking back, it was indeed a mistake for me to have despaired thinking that I had not made it to the training team despite the results not having been announced yet.

The 30+ IBO training sessions we had together were an immense privilege. Each training session gave us the opportunity to interact with professors and instructors from diverse fields of Biology. From fervent discussions about evolutionary spandrels, incomplete lineage sorting, coalescent theory and more during our AMA session with Prof. Monteiro, to our rainy field trip

at MacRitchie Reservoir with Dr. Mowe, to Mr. Siva's treat at the Royals Bistro, I thoroughly enjoyed myself during every training session, with the post-training lunches/dinners as a bonus I would look forward to each week to get to know my teammates better.

I went into the selection camp with excitement, harbouring the mentality that I will just go in there, have fun, and hopefully make it to the team. True enough, I had lots of fun interacting with my batchmates and seniors over the five days. I would say that the camp was definitely a crucial aspect in making our batch even more bonded together, a goal I had always wished to achieve for my team (mostly using humour and caring for others in times of need), as we would support and encourage each other after each gruelling test. It was extremely inspiring to see so many seniors come back to help out with the camp, be it to set and mark the camp papers till late at night (especially Lucas who would come all the way to NTU after work every night), or to provide us with socio-emotional support by eating with us at the North Spine canteen, or by being a constant source of laughter (@batch of 2021). By the time the results were finally released I had grown anxious, especially since I was the last name to be announced for the team. I later took over the role of team leader from Alicia (who had done an excellent job of being a team leader). I was relieved that I had made it, but at the same time I knew that I had to bid a bittersweet farewell to the rest of my training teammates.

Our IBO training sessions :)

Selection camp

Fast forward to the actual IBO, some of my most memorable experiences include getting to know competitors from all over the world (Vietnam, Poland, South Korea, Thailand, Czech Republic, …), sitting in the waterpark café for the entire day chatting with Richard from the US (who writes problems for the USABO Mock Exam on Discord!) and Alex from Australia. While the exams were easier than usual, my biggest regret, if any, was probably to have played too conservatively for fear of the next exam being harder than the previous, and to have been a bit too overconfident with my theory, which led me to focus almost entirely on the practical in the lead-up to the IBO post selection camp, spending every day rehearsing biochemistry practicals either in the school lab with water in place of actual reagents, or at home using pens as mock micropipettes and mock equipment drawn

out on paper. Never did I expect, though, to be second in the world in the ecology and ethology practical, especially since I did not manage to fully familiarise myself with the functions of the calculator given to us on the day of our arrival and ended up having to brutalise all the statistical tests by hand. I am really grateful to have had such a wonderful jury comprising of Dr. Goh, Dr. Chen, Mr. Foo and Jing Si to fight for our marks to the best of their abilities, and without whom such results would have been impossible.

The IBO experience

To end off, I wish to ask: What exactly does the IBO spirit represent? My first encounter with the term was in 2020 while watching the IBO 2020 video, where the phrase "The IBO spirit never fades!" was used to signify the unwavering spirit of the IBO community banding together as one in spite of the challenges posed by the COVID-19 pandemic, or as they say, no IBO equals no life. Does the IBO spirit represent the power of our shared, burning passion for Biology in transcending geographical boundaries to unite us? Does it represent the spirit of collaboration between the world's brightest biologists in order to create a better world? Or does it represent something simpler, like an innocent young child's pure inquisitiveness and genuine love for the natural world, and a set of life principles in the never-ending quest for excellence? To me, it is all of the above. My Biology Olympiad story arc may have concluded (as I step into the world of being an alumni and begin a fresh story arc), but yours is just about to begin, and it is up to *you* to find your own answers.

When I first interacted with you on the bus back home, I had the feeling that you would be more than you let on and your behaviour in IBO only proved that point true. I swear I will never understand your strange antics, but it did make our IBO story funnier and more enjoyable to share with my friends. May our batch go down as the most chaotic group of IBO competitors to ever exist!

From Le Xuan

I'm glad to see you succeed in every step of the way up to IBO. I've seen how hard you work and how much this means to you and I'm glad that your efforts came to fruition. Thanks for being a great companion throughout the whole SJBO-SBO-IBO journey as well, I thoroughly enjoyed discussing questions with you and am glad we could support each other through this journey!

From Jerome

Hi Lionel, I thought I was the most chaotic until I met you. You are the person behind the giggles and the conversations we four shared and I'm glad I got to know you so much better through this experience. You are definitely one of the reasons why the training team is so bonded. Your interests may be funny (to me it is), but I think you have a great heart too :) Cheers!

From Debraath

THOUGHTS FROM THE TEAM

By Lai Le Hao Jerome (ranked 4th)

"And the 4 that will be moving on to represent Singapore are Debraath, Le Xuan, Jerome and Lionel." I was immediately awash with an immense sense of euphoria and relief just as Dr Goh said those very words. The hours of hard work in reading textbook after textbook and doing paper after paper finally paid off. I finally had the chance to represent Singapore and see how far I could go.

Looking back, the journey towards the IBO was far from direct and smooth sailing. It was more akin to a meandering river, with the ebbs and flows of life shaping the course of my journey. In secondary school, I had not yet committed to the grind of a single science subject, instead striving to be a polymath, and I took much joy in being able to see connections across various scientific disciplines (reading the application of differential equations for transcriptional regulation by activators was exhilarating).

But towards the end of my secondary school days, I wondered how I wanted to conclude my Olympiad journey. Was it to win as many gold medals across as many Olympiads as possible? Or was it to thoroughly excel at one, so that I may eventually have the remote possibility to represent Singapore? As you might have guessed, I chose the latter and eventually settled on the subject which I had the most interest in and the greatest passion for.

The first Biology Olympiad I treated seriously was the SJBO in Year 4. Unfortunately, I failed to make the team to represent RI in Round 2. That experience seriously affected my self-confidence, as not only had I thought I worked hard for it (having read Campbell and Molecular Biology of the Cell), but more worryingly, I also had no idea what went wrong. Defeated and lost, I felt unsure whether to continue striving towards the goal of IBO which seemed so out-of-reach.

Serendipitously, I came across the "2019 IBO Batch Google Drive" and saw their recommended reading list. I then realised how little I knew and how much I had to learn to reach their level of biological understanding. Inspired, I took on the challenge, plunging headfirst into the depths of the vast field of Biology.

That proved to be the best decision of my life thus far. With every book I read, I was exposed to a new world of Biology and with every problem I was doing, I could feel the strengthening of synapses between the neurons in my brain. I did not know it at that time, but this part of the journey was arguably the most valuable part of the Olympiad experience: learning never to give up no matter how difficult a problem may be, how complex a concept can be to understand and to always keep going even when the going gets tough. There were countless moments of self-doubt and fear that all my efforts would be in vain, but I always reassured myself with the fact that regardless of the outcome the knowledge I learned and the character I built will be mine to keep.

After going through SBO, I was delighted to find out that I made the national training team. The biweekly training was extremely fun and fulfilling and brought learning Biology alive in a way I never felt before. From seeing ants ooze out of a cut stem to seeing (and touching) a kangaroo specimen, my fascination with the wonders of Biology compounded. It was also here where I found a community of friends who shared the same passion as I have, which made every training session so enjoyable.

Dr Norman Teo's indoor farm

After our 1st training session with Mr N Sivasothi and his students

The months flew by, and the 1-week selection camp at NIE finally began. If the essence of the Olympiad is to push your limits, this one week certainly epitomises it. But at the same time, there is a certain tranquillity in being in NTU, away from the bustle and hustle of city life, focusing on just doing the one subject that I have so come to love. And finally, on the last day, I found out that I made the team.

One month later, we are off to Abu Dhabi, United Arab Emirates. The experience was amazing. Meeting so many people from so many different countries reminded me of two opposite yet related concepts in Biology: diversity and unity. Seeing people from so many different lands

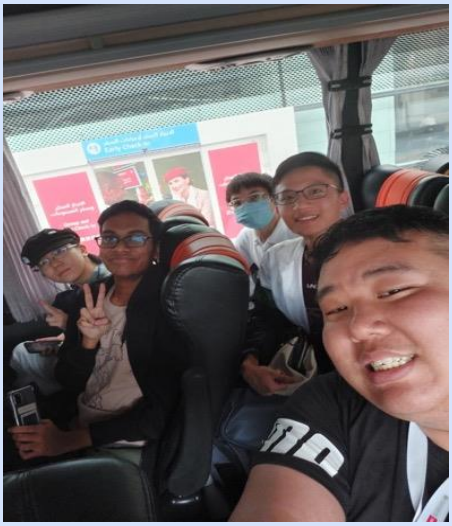
and speaking so many different tongues, I saw how we all had vastly different cultural experiences, religious identities, and ways of life. I also saw how different countries dressed up in their traditional attire for the opening and closing ceremonies and learned from the Indian team how to make a water bottle cannon (which sent bottle caps flying all around the canteen during meals).

An iconic moment when we joined our lanyards in a circle around the entire canteen, with each of the four colours reminiscent of the four nitrogenous bases in DNA.

At the same time, I was struck by how similar our experiences of preparing for the Biology Olympiad were and how we shared the same popular cultural experiences.

For the competition itself, I gave it my all, traversing the sample space of possible lines of thought to find the most reasonable one. The practical was slightly more challenging, having to juggle multiple tasks in a restricted amount of time, while making sure that every step was executed meticulously. Unfortunately, I made some practical errors and was honestly quite worried about how much they would end up costing me.

Finally, it was time for the closing ceremony. We all nervously awaited the results, convincing each other that we would do fine. It did not help that our Jury gave particularly cryptic messages like "the scores are very close". It began. Bronze went…and none of us went up. Then Silver went…and none of us went up. We all got Gold! Finally, my efforts paid off handsomely and we achieved results that both myself and our country can be proud of.



Featuring Kevin Bao from Team USA Jury, Team Hong Kong and Team Saudi Arabia!

At the end of the day, while the IBO was just a little more than a week, the experience was unforgettable and was genuinely one of the best experiences I have ever had. But more importantly, the IBO experience was more than a one-week workcation, it was the culmination of 3 or more years of hard work and a long journey which brought many treasured people into my life.

To my friends and family: Thank you for your unwavering support. Without it, I would never had the courage to try and my dreams would have never become a reality. To Dr Beverly Goh, Dr Chen Zhong, Mr Foo Yongkuan and Jing Si: Thank you for pulling through all the late nights to ensure that the questions were unproblematic and for fighting for every single mark for us. To all the Professors, teachers and alumni: Thank you for imparting valuable knowledge, skills and wisdom which is relevant not just to Biology but life itself. Special thanks to all the alumni for organising the camp and going through papers with us in the lead-up to the IBO. To my training team batchmates: Thank you for being such a fun and amazing bunch whom I shared precious memories of the training sessions, camp and more with. You are all so multi-talented and I have learned so many different things from all of you. And finally, to those interested in the Biology Olympiad: Don't fear. Go for it. Because the treasure is not what lies at the end, but whatever you find along the journey.

Flight back after a hectic but fulfilling week at IBO!

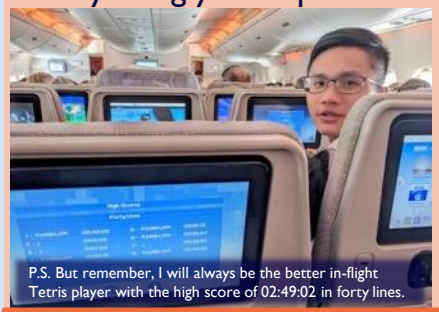
Jerome... you have put in so much effort to be a grind master. Despite how knowledgeable you are, you've always been so down to Earth. I still remember when we first met at that MOE meeting room waiting for our interview back in mid-2022, and now we are done with IBO 1.5 years later. I know I clown you loads, but also know that I respect you immensely. Stay winning!

From Debraath

Thank you for trying out my concoction of interesting Bio problems and discussing them with me, as well as for reading textbooks together with me. Apart from being my classmate for 2 years, you were also a great roommate during selection camp! It was fun participating in the mock USABO exam together with you earlier this year too!

From Lionel

Jerome, you are the most genuine friend I have and it's a joy to converse with you about any topic in mind. Don't ever underestimate yourself, for your hard work and humble attitude will surely bring you to places!



P.S. But remember, I will always be the better in-flight Tetris player with the high score of 02:49:02 in forty lines.

From Le Xuan

THE 8TH SINGAPORE JUNIOR BIOLOGY OLYMPIAD

In partnership with Mandai Wildlife Reserves (MWR)

This year, a record-breaking 2,347 students from 93 schools participated in the online Theory Round of the 8th Singapore Junior Biology Olympiad (SJBO). Of these, 28 students from the seven top-performing schools were invited to participate in the Practical Round.

This year, SiBiol is very honoured to work with our partner, Mandai Wildlife Reserve (MWR) for the 8th SJBO Practical Round 2023. This is also our first time to conduct the event in Mandai Zoo for the schools who had emerged from the SJBO Theory Round. They are Raffles Girls' School, NUS High School, Anglo-Chinese School (Independent), Raffles Institution, School of Science and Technology, Nanyang Girls' School and Hwa Chong Institution.

The seven top-performing schools gathered at Mandai Zoo for the Practical Round

With an aim to expose the students to zoology and veterinary science, both SIBiol and MWR worked in great synergy to design interesting theoretical and hands-on tasks that involved real specimens from large animals. Frankly speaking, what are the chances of anyone dealing with poop from giant pandas and giraffes, just to answer questions? At a more exciting landscape, one representative from each participating group was required to visit Fragile Forest to observe the environment and propose a new exhibit design whereas another representative had to carry out an On-Job-Training task on molecular techniques and demonstrate the skill sets within 30 minutes. While the students appeared to have been scattered in the vicinity, their combined teamwork and cooperation skills had allowed them to relay effective communication and complete all tasks with pride and glory. As a reward for all the hard work, the students and accompanying teachers had a fulfilling talk about species management of the Malayan sun bears, an exciting behind-the-scenes guided tour and a comfortable tram ride, before we ended the day.

Students intensely focused on the exhibit design task at the Fragile Forest

The results for the 8th Singapore Junior Biology Olympiad were announced during the SIBiol Public Forum a few weeks later. Raffles Girls' School emerged as champions, while NUS High School and Anglo-Chinese School (Independent) clinched 2nd and 3rd places respectively. An Honourable Mention was bestowed on Raffles Institution, while the rest of the schools received Participation. Good job to all schools!

Special thanks to our partner, Mandai Wildlife Reserve, for providing the students with a unique and enriching SJBO experience!

SIBIOL PUBLIC FORUM 2023

Co-organised by SIBiol and Science Centre Singapore

This year's annual Public Forum was held on 26 August at Science Centre, with the theme of Aquaculture and Food Security. It began with the traditional opening address by the 49th SIBiol president, Dr Nicholas Yap, followed by another address by Professor Lim Tit Meng, the Chief Executive of Science Centre Singapore. Hosted by council member Dr Cynthia Wong, speakers Dr Lee Wee Chee and Dr Adrian Elangovan gave insightful speeches into the role of aquaculture in building Singapore's food security to the audience of SJBO practical awardees, teachers, members of the public and SIBiol members.

Dr Lee's speech on Aquaculture and Food Security provided the audience with insider insights into the development of aquaculture technologies in Singapore, assessing their potential in contributing to food security in Singapore. Meanwhile, Dr Elangovan's speech on the prospects and challenges of aquaculture was accompanied with intriguing videos that captivated the audience, and he also shared about his own experiences with research on aquaculture overseas.

Q&A session with the audience

Following the two speeches, there was a short Q&A session with the audience. Then, a representative of Mandai Zoo gave a short presentation on SJBO 2023 Practical Round, which was held in collaboration with Mandai Zoo that year. Finally, prizes for SJBO were awarded to the participants by Professor Lim Tit Meng.

All participants then enjoyed a buffet lunch at the Atrium, where they happily celebrated their wins with their families and friends and reminisced on memories of the competition. All in all, the annual SIBiol Public Forum this year was yet another success.

A representative from Mandai Zoo shares about SJBO 2023 Practical Round, which was held at Mandai Zoo

Raffles Girls' School, the champions of SJBO 2023, posing with their award. Congratulations!