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From left: Lim Tse Yang, Zhang Tianyi, Huang Weixin, and Brandon Seah, rejoicing after the prize-giving ceremony

**Report on the 15th International Biology Olympiad**

*TM Lim and Shirley Lim*

*Co-leaders, Singapore Team, 15<sup>th</sup> IBO (2004)*

The 15th International Biology Olympiad was held in Brisbane, Australia, from 11 to 17 July 2004. The competition was held at the University of Queensland where the (IBO) students were housed, while the Jury members were isolated at the University of Griffith where questions were vetted and marks scrutinized.

The International Biology Olympiad is a yearly event, and Singapore has taken part since 2001. This year we broke our own records, clinching the top gold medal and the fourth gold medal, emerging overall 2nd out of 40 countries, with two Gold and two Silver Medals!

Lim Tse Yang (RJC) won top honours by ranking 1st in the world, followed closely by Brandon Seah (ACJC) who was ranked 4th. The two Silver medalists were Huang Wei Xin (HCJC) and Zhang Tianyi (RJC). All four Olympiad competitors were selected from the medal winners in our own Singapore Biology Olympiad (SBO), organised by the Singapore Institute of Biology (SIBiol). As the Chairman of the SBO Organising Committee-cum-Vice-President of SIBiol (*TML*) and President of SIBiol (*SL*), respectively, we were responsible for leading the team.

## Editor's Note

This final issue of the year contains articles on the following major SIBiol activities over the past year: the Workshop on Life Science for primary science teachers; Bioinformatics workshop for secondary science teachers; and participation in the 15<sup>th</sup> International Biology Olympiad, in which the Singapore team achieved the best result so far since it began participating four years ago in this annual competition. Also inside are updates on the *Biology in Asia* International Conference, which will be held on 7-10 Dec 2004 in celebration of our institute's 30<sup>th</sup> Anniversary.

Many thanks to those who have contributed articles, announcements and photographs, and helped in various other ways towards the publication of this year's SIBiol Bulletin (Volume 27, nos. 1 and 2).

*Darren Yeo*



The Singapore team taking the IBO participants' oath during the opening ceremony

The training of these students involved colleagues from the Department of Biological Sciences/NUS and many colleagues at NIE/NTU. While our students are of good quality, the trainers' contribution and the support of DBS/NUS and NIE/NTU are indispensable. Many nations are curious about how we ranked among the top five national teams each year since we joined IBO in 2001. We have set a high standard and we continue to look to the department/faculty and the universities for support.

**There were 40 nations with four students each in this year's IBO. The top 10 medal tallies are listed below:**

1st	USA	4 Gold
2nd	Singapore	2 Gold 2 Silver
3rd	United Kingdom	2 Gold 2 Silver
4th	China	2 Gold 2 Silver
5th	Thailand	1 Gold 3 Silver
6th	Taiwan	1 Gold 3 Silver
7th	Korea	1 Gold 3 Silver
8th	Germany	1 Gold 2 Silver 3 Bronze
9th	Canada	1 Gold 1 Silver
10th	Ukraine	1 Gold 3 Bronze

**The top 5 ranking Gold medalists were:**

1st	Lim Tse Yang, Singapore
2nd	Liu Yuh-Yah, Taiwan
3rd	Katherine Aull, USA
4th	Brandon Seah, Singapore
5th	Bradford Hargreaves, USA

The competition was very keen and students had to complete four sets of practical tasks and two sets of theory papers under a very tight schedule. All competitors were top students from their respective countries. Yet, some students were extremely stressed out by the various tasks and tests – some broke down and cried; one even gave up midway!



From left: Drs Yap Ann Teck (MOE representative), TM Lim (Vice-President, SIBiol) and Shirley Lim (President, SIBiol) sequestered in the Jury Room during the IBO question-vetting sessions.

The IBO standard gets higher each year as the scope and nature of questions follow the advancement in biology and life sciences. There were many thinking and challenging questions to test the best minds. For example, this year we began to see questions on proteomics and advanced topics such as transposon and GMO; and more challenging biostatistics questions were set including interpretation of human patient samples as raw data! The questions set by the Australian host universities were different from past IBO in that questions were assembled in clusters around a thematic topic. For example, one set of questions asked about cows in diary farms — from their physiology, genetics to behaviour. Another set involved mosquito biology, ecology, mangrove and wetland biology and how to select a site for ecotourism.

Many nations value their medalists and shower them with scholarships. Their local newspapers will publish the results even before the national teams reach home. For the first time, we were pleased to see reporters from the Chinese paper, Zaopao, meet us at the airport to interview the triumphant team upon our return. Interestingly, Singapore President S. R. Nathan, actually invited the students from all the Olympiads to attend a tea reception at the Istana on 14 August 2004. Dr Shirley Lim and the four IBO students had the honour of meeting him in person. At least, our President had sent a very good message of appreciation to the teams.

Our past IBO medalists are all doing well in their scholastic pursuits. A few of them have won prestigious scholarships from our Government: one of them is a President Scholar currently reading Bioengineering in Duke University while his team-mate from the 2001 team is in Stanford University with A\*Star sponsorship. Last year's gold medalist has just started her undergraduate studies at Harvard University - these are just some examples of how these students are heading for a bright future in the field of biology. All our participants so far were either gold or silver medalists. They will be our future leaders in biology and biomedical sciences.

Next year's IBO will be held in Beijing, China. It will be challenging as China has the reputation of dominating the medal hauls at previous IBOs. The questions of next year's IBO may well be of a higher standard than the previous years'. We shall continue to prepare our team well for the challenge and may our future teams continue to bring home honour and glory for our nation!



The whole Singapore contingent - together again

## 15<sup>th</sup> International Biology Olympiad (2004) The Students' View

*Lim Tse Yang, Ng Weixin, Brandon Seah and Zhang Tianyi  
Singapore Team, 15<sup>th</sup> IBO (2004)*

“Hurry up and get to your seats!” said the lady at the front of the hall. It was then November 2003, and we were sitting for the theory paper of the Singapore Biology Olympiad (SBO). At the time, we didn't know who she was, much less expect that in less than a year, she would be co-leading us to Brisbane for the International Biology Olympiad (IBO), and that by then, she would have become not just a teacher but a mentor to us as well.

Of the numerous students who took the theory round with us, 32 were selected for the practical round, and from that pool, seven local medallists were chosen for training after an interview with representatives from the Singapore Institute of Biology (SIBiol).

From March 2004 onwards, training was held twice weekly (primarily at NUS), where the lecturers would go through course material that they taught to undergraduates, sharing their knowledge and experience. Looking back, we realise how privileged we were to have had this opportunity – as our team's leaders confided to us how the lecturers had offered their goodwill and free time to train us, for which we are grateful. In June, our training continued with a weeklong residential camp at NIE. Under the watchful eye of the NIE lecturers, we learnt and refined many practical skills such as dissection and microscopy, staying late in the laboratory (until midnight, once!) to practice. This training stood us in good stead when the actual IBO came around; and while not everything we learnt there was actually put to use in the competition, the skills will certainly be of help in our future studies as young biologists.

Staying on campus as a team was a good experience – we took the opportunity to explore the place, sampling food at the different halls in NTU, browsing (and singing!) in the bookstore, and playing

cards in the hall common rooms. It gave us the chance to understand and appreciate each other much more, bonding us closely as a team. It did not, however, prepare us for what was to come on the last day of that camp – a surprise selection test, cooked up just that morning by our harried professors. The tension kept us on the edge of our seats after the test, as the names of the four selected for the actual competition were announced. It was a difficult choice – all seven of us were very closely matched in ability – such that A/P Shirley Lim joked about not being able to take the strain of selection every year.

In the short weeks from the test to our departure, we ate, drank, slept, breathed and lived biology, giving our all in the final run-up to the competition. The 10<sup>th</sup> of July came round all too soon, and we were at the airport, along with A/P Shirley Lim and A/P Lim Tit Meng from SIBiol, as well as Dr Yap Ann Teck from MOE. Family, friends and former IBO representatives for Singapore turned up to see us off – testament to the strong bond preparing for and participating in the IBO establishes amongst team members.

Shortly after touching down in Brisbane the next morning, we were shuttled off first to Griffith University, where we were separated from our team leaders, not to hear from them again till the next day, then to the University of Queensland (UQ), where we were to spend the week. There we met our guide Min-Zhao, a medical student at Melbourne University and a thoroughly friendly character, who over the next seven days would chaperone and accompany us, and even lend us his medical knowledge in those desperate few minutes before the theory paper.

In that first day of rest, as in much the week after, we spent the time interacting with participants from other countries, from Kyrgyzstan to Korea, playing games, exchanging stories and making friends. Don't let the name fool you – above all else, the IBO was about the people, not the competition; a chance for bright young minds the world over to come together, not to compete, but simply to interact and connect.

Monday 12th July, saw the opening ceremony, a magnificent affair with a

variety of cultural performances – Australia is nothing if not vibrant – and also the formal pledge-taking, where participants and jury members alike swore to uphold the principles of fair play,



in accordance with the spirit of the Olympiad. Shortly after the ceremony, we were separated from our leaders again, and before we knew it, the time for the dreaded practical round had arrived.

The practical round comprised four tasks, which we did in groups (colour-coded, of all things, by our lab coats); one each on molecular, cellular, organismal and environmental biology. Coincidentally, part of the organismal biology task involved using a dichotomous key to identify ants – much to our delight, as that had been precisely one of the tasks of the SBO practical round months earlier. Despite that, however, the tension was severely nerve-wracking; some participants were in tears after the tasks were over.

To help relieve this stress, that night a big party was thrown for the jury and us at an Australian Woolshed, complete with good food and mass dancing. Tense faces earlier in the day melted into smiles, and at one point the limbo pole was even brought out. Anyone who thinks that the IBO is a gathering of geeks and nerds should have been there that night to see us.

The next day was another rest day, with a visit to the Australia Zoo to admire the

unique local flora and fauna, before the two gruelling three-hour theory papers on Thursday. All those months of preparation were brought to bear in those six hours as we pit our wits (honed by

the efforts of all our professors) against scores of multiple-choice questions covering every field of biology, requiring us to think on higher levels and pushing us to our very limits. We emerged to the applause of our guides, thankful that at last the competition was over – and we had survived.

As a reward for coming this far, we were treated to something special that night – the Gold Coast theme park, Sea World, was opened exclusively for us, and we indulged in a sumptuous buffet, enjoyed a roller-coaster ride, and danced the night away (despite the rain), all the trauma of the previous three days forgotten.

Our results were to be announced on Saturday, 17 July; in the interim, we enjoyed a visit to a beach on the Gold Coast, as well as a nature park to admire a waterfall and strange rock formations. Saturday morning involved a visit to the city centre – the only one in that whole jam-packed week – to squeeze in some shopping, before the long-anticipated closing ceremony.

This was it – everything we had worked for, since our journey began at the SBO nine months before, culminated in this hour of judgement. And yet by then we

knew that beyond this result, all of us would take away something worth far more, something priceless – the experience of this event, and the friendships we had established with so many people, from the Swiss to the Thais to the Canadians and more – these were worth more than any gold medal. That said, it was inevitable that we waited with bated breath as the results were announced. And they were far from disappointing.

Singapore won two silver and two gold medals, including an almost unbelievable 4<sup>th</sup> and 1<sup>st</sup> individual rankings; as a team Singapore was 2<sup>nd</sup> out of 40 countries – an achievement for Singapore unmatched on both individual and team levels, not just in the Biology Olympiad but in any international competition, academic or otherwise, that Singapore has ever taken part in.

This unparalleled accomplishment was the result of months of effort on the part of the lecturers from NUS and NIE who trained us; all those hours spent answering our strange questions and instructing us on practical skills were undoubtedly what made this feat possible. In particular, we are grateful to A/P Lim Tit Meng, A/P Shirley Lim and Dr Beverly Goh, for organising the training sessions, conducting the residential training camp, and nurturing our passion for biology; and for A/P Lim Tit Meng and A/P Shirley Lim, for accompanying and caring for us while we were in Brisbane. You have become more than just teachers to us; we cannot thank you enough.

Beyond medals, the Olympiad was, quite simply, an invaluable experience for all of us. May generations of Olympians enjoy it in the years to come.

## WE WELCOME THE FOLLOWING NEW MEMBERS

### Ordinary Members

Ms Lee Su Li  
Ms Rosiah Ahmad  
Ms Lim Lian Ching  
Mr Mohd Kamal M.S.

### Student Members

Ms Seah Wee Khee  
Ms Lee Wan-Jean  
Ms Tay Yi Lin

## Workshop on Life Science for Primary Science Teachers

The life science workshop entitled “The Microbial World” was co-organized once again by the Singapore Institute of Biology and the National Institute of Education, Nanyang Technological University (NIE/NTU). This workshop has been run the past few years in response to continued demand and interest from primary science teachers. This year’s workshop was held at NIE/NTU from 23-24 June 2004, and attended by 44 participants from various schools. The co-ordinator of the workshop was Ast/P Li Daiqin, and the resource persons were: A/P Tham Foong Yee, Mr Timothy Tan and Dr Tan Lay Pheng.

More information and photographs available on the SIBiol website at <http://www.sibiol.org.sg/>



## **BIOLOGY IN ASIA INTERNATIONAL CONFERENCE**

7<sup>th</sup> to 10<sup>th</sup> December 2004

**National Institute of Education, Nanyang Technological University**

Conference website: <http://www.dbs.nus.edu.sg/sibiolconference/>

The Singapore Institute of Biology (SIBiol), together with the National Institute of Education (NTU), and Department of Biological Sciences (NUS), is organising *Biology in Asia*, an international conference to be held from 7-10 Dec 2004. The conference, which marks the 30<sup>th</sup> anniversary of the SIBiol, will be held at NIE.

### **Opening Ceremony (7 Dec 2004)**

The Minister of Education, Mr Tharman Shanmugaratnam, will be the Guest of Honour at the conference opening ceremony, which will also see the delivery of the Conference Keynote Address by Dr Jane Goodall (Jane Goodall Institute for Wildlife Research, Education and Conservation). In her speech, entitled "*Reason for Hope*", Dr Goodall will speak about the 44 year research at Gombe Stream into man's closest relative, the Chimpanzee, and how this had led to the Jane Goodall Institute's current programmes to benefit people, animals and the environment we all share. Roots & Shoots is her humanitarian and environmental programme for young people now active in more than 80 countries around the world.



Conference Keynote  
Speaker, Dr Jane Goodall

### **Plenary talks (7-10 Dec 2004)**

#### Biodiversity, Ecology and Conservation in Asia

Speaker: Dr Stuart Davies (Harvard University, USA)

Title of talk: *Tropical forests of Asia: long-term changes in diversity and dynamics*

Speaker: Dr Lucius Eldridge (Bishop Museum, Hawaii, USA)

Title of talk: *Aquatic Invaders in Hawaiian Waters*

Speaker: Dr Patrick Grootaert (Royal Belgian Institute of Natural Sciences, Belgium)

Title of talk: *Global diversity and rain forests: a challenge for the entomologist*

Speaker: Prof Roger Kitching (Australian School of Environmental Studies, Griffith University, Australia)

Title of talk: *The Biodiversity of Insects in Old-World Rainforests - scale, beta diversity, and the Asia/Australia divide*

Speaker: Dr Peter Ng (National University of Singapore, Singapore)

Title of talk: *Of Crabs and Men: The Changing Face Of Systematics*

Speaker: Dr Pilai Poonswad (Mahidol University, Thailand)

Title of talk: *Conservation of Hornbills in Thailand*

Speaker: Dr Jan Slikkerveer (Leiden University, the Netherlands)

Title of talk: *Biopiracy versus Bioprospecting: Intellectual Property Rights and the protection of Ethnobotanical Knowledge Systems*

#### Biotechnology in Asia

Speaker: Dr Charles Arntzen (Arizona State University, USA)

Title of talk: *Production and Down-Stream Processing of Plant Derived Oral Vaccines*

Speaker: Dr Michael E. Horn (Prodigene, Inc.)

Title of talk: *Molecular Farming: Current Products and Future Prospects*

Speaker: Dr Maurice Moloney (Sembiosys Genetics, Inc.)

Title of talk: *Production and purification of biopharmaceuticals from transgenic oilseeds using olesin and oilbody technology*

#### Biology Education in Asia

Speaker: Mr David Micklos (DNA Learning Center, Cold Spring Harbour Laboratory, USA)

Title of talk: *Coming into the Gene Age: The Challenge to Biology Educators*

Speaker: Mr Hans Morelis (National Institute for Curriculum Development, The Netherlands)

Title of talk: *Make Your Education Nice, Useful and Pleasant*

Speaker: Prof Leo Tan (National Institute of Education, Singapore)

Title of talk: *The nurturing of young biologists in Singapore*

### Conference Banquet (9 Dec 2004)

All registered participants of the conference will be eligible to attend the dinner. This event, which is also the **SIBiol 30<sup>th</sup> Anniversary Dinner**, will be held at the Jurong Bird Park. During the dinner, SIBiol will take this opportunity to honour some of our members with Honorary Fellow, Fellow and Distinguished Biologist awards

**Note:** SIBiol members are entitled to discounted registration fees.

## SIBiol Research Trust Fund - Call for Project Proposals

The SIBiol is inviting applications for Research Grants under the Institute's Research Trust Fund (RTF). The aim of the RTF grants is to support/facilitate research on local topics/questions in biology by SIBiol members. To date, the RTF has supported 30 research projects.

Applications are open to Ordinary members as well as Student members of the SIBiol. Student member applications must be in collaboration with an Ordinary member. Grants awarded are up to a maximum of S\$5,000.00, for a two- or three-year project. Grants are strictly meant to cover the cost of consumables or student assistance, and not for the purchase of equipment. Interested members should submit their Project Proposals in triplicate by **15<sup>th</sup> January 2005** to:

**The Honorary Secretary  
The Singapore Institute of Biology  
c/o Natural Sciences Academic Group  
National Institute of Education  
Nanyang Technological University  
1 Nanyang Walk  
Singapore 637616**

The Project Proposal should include the following:

- Objective(s)
- Background information
- Significance of the project
- Itemised estimated costs

### List of projects supported by the SIBiol Research Trust Fund in the last 10 years

1. "Regeneration of injured tissue in *Acabaria* sp. (Gorgonacea, Octocorallia): An *in situ* experiment." (1994)
2. "Studies on photosynthetic responses to high solar radiation on high value crops." (1995)
3. "Studies on the biology and transmission of protozoan parasite blastosystis." (1995)
4. "Typification of Ridley's Malaysian species." (1996)
5. "Application of RAPD-PCR and RNA fingerprinting to estimate natural genetic variation in *Acacia Mangium*." (1996)
6. "Factors affecting hatch rates and sex ratios of the green turtle (*Chelonia mydas*) eggs in natural and hatchery nests at Talang Talang Besar, Sarawak." (1997)
7. "Conservation needs of key Southeast Asian taxa." (1999)
8. "Experimental fragmentation and transplantation of the scleractinian coral *Goniopora* to study the relative effects of light, sedimentation and fragmentation on its reproductive cycle and fecundity." (2001)
9. "Using *in situ* mesocosms to study the effects of heavy metal and petroleum hydrocarbon loading on phytoplankton and bacterial dynamics." (2001)

## Bioinformatics Workshop for Secondary School Teachers

*Low Boon Chuan*

*SIBiol Bioinformatics Workshop Coordinator, 2004*

A workshop on bioinformatics entitled “**Understanding your Chilli Crab Better – the Bioinformatics Approach**” was organised for Secondary School teachers, and held on 26 June 2004, at the Department of Biological Sciences, NUS. The workshop facilitators were: Asst Prof Low Boon Chuan (Department of Biological Sciences, NUS) and Ms Lim Yun Ping (Bioinformatics Institute).

This programme was intended to provide an overview and some hands-on practical experience on the power of computational tools to solve various biological issues, from the questions in basic biology to understanding how certain diseases could have developed. The workshop started with an introduction on the molecular biology of DNA and proteins and how genetic information can be transmitted and deciphered. Various important and useful public databases were explored using specific examples and participants had the chance to retrieve, filter, interpret and analyse the results in a friendly and interactive environment.

Eleven secondary teachers had participated in this workshop and were excited to see the potentials of such exercise to be developed in future class-room teaching for a cross-disciplinary course and science projects.

More information and photographs available on the SIBiol website at <http://www.sibiol.org.sg/>



Close interaction between trainers and participants during step by step practice.

## 5th SINGAPORE BIOLOGY OLYMPIAD November 2004

**National Institute of Education, Nanyang Technological University**

The 5<sup>th</sup> Singapore Biology Olympiad (SBO) is scheduled for November 2004. This annual competition is once again being organised by SIBiol, with support from the National Institute of Education, Nanyang Technological University (NIE/NTU), Department of Biological Sciences, National University of Singapore (DBS, NUS) and Ministry of Education, to identify the best and brightest pre-university biology students in Singapore. The theory test will be held on 5 Nov 2004, with shortlisted candidates going on to sit for the practical test on 17 Nov 2004. Both rounds will be conducted at NIE/NTU.

More information and photographs will be available on the SIBiol website at <http://www.sibiol.org.sg/>

## Migration of the SIBiol website

We are pleased to announce that the institute has completed migration of the SIBiol website to its own commercial website address.

**The URL is now**  
<http://www.sibiol.org.sg>

The website has also had a facelift, so do drop in to see its new look!