

Promoting microbiology in schools and colleges since 1969

CHAIRMAN'S ANNUAL REPORT 2015-2016

Summary

The 28th MiSAC Annual Competition 2016, *How microbes work for us*, was sponsored by the *Society for Applied Microbiology*. MiSAC is most grateful for the generosity of the Quekett Microscopical Club in continuing its sponsorship for another two years. MiSAC was chosen by Pearson-Edexcel to write the *Microbiology Topic Guide 'Microbiological techniques'* in support of the Advanced Biology B 2015 specification. MiSAC has been instrumental in promoting the study of microbiology in Thailand and China. MiSAC contributed an article, *Fungi in schools: a neglected potential*, for the School Zone section of the Microbiology Society journal, *Microbiology Today*. MiSAC continued to offer authoritative advice to schools, colleges and other organisations. Members contributed to a range of meetings, courses and exhibitions in various parts of the UK and abroad. The Committee held four meetings, one of which involved judging the competition entries.

MiSAC Annual Competition 2016, *How microbes work for us*

The requirement of the 28th MiSAC Annual Competition was to produce a popular news story about ways in which microbes work to our advantage, using a lively, fun and entertaining approach modelled on an internet news media site such as BuzzFeed. This maintained the well-established approach of the competition which is to select a topic linked to school curricula but with requirements framed to draw students beyond their confines. Special sponsorship for this year's competition was generously provided by the Society for Applied Microbiology (SfAM),

The topic proved to be particularly popular in attracting entries from many newcomers to the competition, as well as drawing on our pool of regular participants. As usual, there were two entry groups: Key Stage 3 and Key Stage 4 (Secondary 1/2 and 3/4, respectively, in Scotland). Entries came from 104 schools throughout the UK of which 14 made submissions to both entry groups. In total there were 654 separate entries consisting of 507 from KS3 (S1/2) and 147 from KS4 (S3/4). Participation in the KS4 (S3/4) group (23% of entries) maintained the good level of interest experienced in recent years. Although the large majority of the 654 entries were individual submissions, the total number of students involved was 854 when those from groups of students were taken into account.

Members of MiSAC were joined on the judging panel by representatives of the competition sponsor: Professor Martin Adams, a Past-President of SfAM, and Clare Satchell, Public Engagement Manager. The judges looked initially for close adherence to the specified format of entry. This involved entries being presented on one A3 sheet, or two A4 sheets attached together, and arranged in two parts. The first part was an introduction to 4 news stories chosen from 6 widely-ranging options which covered food or drink production, health care, recycling or waste treatment, biofuels and soil fertility. The second

part was a development of one of the stories by focusing on one named species of microbe which had an important role in that activity or process.

Many hand- and computer-produced entries were presented to a high standard and made adjudication very challenging. Some 80% of entries closely followed the stringent entry requirements and collectively presented informative, varied and novel news stories in the required style of an Internet news media site. It was pleasing to see a wide range of topics and evidence of a good grasp of the underlying science, though there is still a need for better observation of the rules of nomenclature regarding use of upper and lower case initial letters for, respectively, genus and species, and italic font, e.g. *Saccharomyces cerevisiae*; also the correct form of the singular and plural case should be noted, e.g. bacterium (singular) and bacteria (plural). There were many examples of a good appreciation of aspects of design including appropriate choice of colours for words and background for entries produced by computer to ensure that the text was legible. It is also worth recording that those students who did not adhere to the specified format of the competition nevertheless benefited from the opportunity to explore the wide range of ways in which microbes 'work for us' and to communicate their findings.

This year, an unusually high proportion of entries (about 25%) did not fully observe the rules about attaching A4 sheets side-by-side and labelling the back of each entry with the name of the student(s), teacher and school. These requirements are important for cross-checking each entry against the entry form on receipt and keeping track of each entry among the many hundreds of submissions through the judging process. On this occasion the organisers remedied the omissions in order not to disadvantage the students concerned.

Money awards totalling £1,240 were made to 1st, 2nd and 3rd prize winners and their establishments, and several entries were awarded a commendation. All of these students will receive an

award certificate; in addition, all other participants will be awarded a certificate of entry, a much appreciated feature of the competition. Also, each establishment will receive some microbiology teaching resources.

MiSAC warmly thanks all participants for making the competition such a success and their teachers for their support and messages of appreciation for this important event. We hope that students' interests in microbiology have been stimulated and we look forward to a similar level of interest in next year's MiSAC Annual Competition.

Prizes and commendations were awarded to students from the following schools.

Key Stage 3 Group: *First Prize* - Libby Herbert, The Cotswold School, Cheltenham, Gloucestershire; *Second Prize* - Poppy Down, Sheffield High School, South Yorkshire; *Third Prize* - Hetty Symes, Stephen Perse Foundation, Cambridge; *High Commendations* - Shahnia Sadiq, Edgbaston High School, Birmingham; Helen Sheng, St Francis' College, Letchworth Garden City, Hertfordshire; Amy Shaw, Haberdasher's Aske's School for Girls, Elstree, Hertfordshire; *Commendation for Design* - Affia Riaz and Abby Greenhalgh, Bury Grammar School Girls, Lancashire.

Key Stage 4 Group: *First Prize* - Sam Robinson, Dr Challoner's Grammar School, Amersham, Buckinghamshire; *Second Prize* - Antony Wright, Monmouth School, Monmouthshire; *Third Prize* - Isobel Jones, Shavington Academy, Cheshire; *High Commendations* - Eugene Lee, St Olave's Grammar School, Orpington, Kent; Jeron Jay Thaiparampil, St Olave's Grammar School, Orpington, Kent; Esme Boore, Ellie Emmerson, Lauren Donohoe and Hannah Griffin, Bournemouth School for Girls, Dorset; Arjun Dhillon, Dr Challoner's Grammar School, Amersham, Buckinghamshire; Ben Evans, Dr Challoner's Grammar School, Amersham, Buckinghamshire.

MiSAC web site and publications

The web site is now hosted by one of our sponsors, the Society for Applied Microbiology (SfAM) under the control of Nancy Mendoza, the SfAM Communications Specialist. As a result of staff employment issues, the amount of time that she could devote to maintaining and restructuring the web site has been greatly reduced. This has caused delays in making changes to the existing web site and uploading new materials. MiSAC has not yet seen evidence that work on the revised web site has been made. Plans for resolving the issue, by training other staff in the use of the Drupal software package for developing the proposed new web-site design, have been put on hold by a recent staff resignation.

There has been a delay in publishing **MiSAC-methods 1: Sourcing, maintaining and using microbes**; images have still to be added. It will provide valuable guidance on the routine tasks involved in preparing for, and conducting, microbiology practical work.

The Chairman has produced **MiSAC-methods 2: Looking at microbes**, drawing on the text which

provided supplementary guidance for the 2015 competition *What do microbes really look like?*.

MiSACactivities 5: Spoilage of oranges

This practical guide, which is still under development, will explore factors which encourage the growth of the mould *Penicillium expansum* on the surface of oranges.

Bite-size practicals, also under development, will provide outlines of some simple practical activities which illustrate the ubiquity and importance of microbes in everyday life.

Finance and sponsorship

MiSAC is delighted to report that the Quekett Microscopical Club has renewed its sponsorship for another two years and is most grateful for the Club's continued affiliation. MiSAC finances remain healthy, thanks to prudence in expenditure and the much-appreciated support from its sponsors:

- *British Mycological Society (BMS)*,
- *CLEAPSS*,
- *Microbiology Society (MS)*,
- *NCBE*,
- *The Quekett Microscopical Club*,
- *Society for Applied Microbiology (SfAM)*,
- *SSERC*.

Their generosity provides either an annual financial contribution, or meeting rooms and laboratory facilities. Special sponsorship by the Society for Applied Microbiology covered the cost of the 2016 competition.

MiSAC has limited its expenditure by reducing commitments at conferences and exhibitions which would not be cost effective. For example, we chose not to have a stand in the main exhibition area at the annual conference of the Association for Science Education (ASE). The annual return was made to the Charity Commissioners.

Advisory work

MiSAC was asked by Pearson-Edexcel to contribute to its series of topic guides to support aspects of its specifications at Advanced level. The Chairman undertook to write the *Microbiology Topic Guide 'Microbiological techniques'* in support of the Advanced Biology B 2015 specification. The guide is a 16-page, A4 document which gives a wealth of information on culturing microorganisms. In addition, it provides guidance on two practical procedures: growth measurement and isolating species from a mixed culture by streaking. The guide is now freely available via the Edexcel web site.

The Treasurer has continued promoting MiSAC in Thailand and China. Working with the Institute for the Promotion of Science and Technology Teaching (IPST) in Thailand, MiSAC organised in 2014 & 2015 two poster competitions. These were co-sponsored by the BMS and aimed to encourage the study of mycology in schools whilst coinciding with mycological conferences held in Thailand.

Despite the great success of these competitions, IPST has decided not to offer the competition in 2016. This is for domestic reasons: a new national curriculum is in the process of being rolled out. All IPST staff will be fully occupied in producing text books and practical science activities, and to train teachers. Particular emphasis is being put on STEM education projects which will first be implemented in pilot schools linked to IPST, and then throughout the country.

It is anticipated that the competition will resume in 2017, as it is valued as an innovative way of encouraging students to do independent research and to think 'outside the box' - two things which do not happen often in SE Asian education. The competition theme may be based on dengue fever, which is becoming very common in Thailand, or the Zika virus.

In China, the poster competition, entitled *Useful Fungi*, was aimed at middle-school students and 300 entries were received from 3 provinces. Judging of the quality of the posters took place in June and the prize winners received their awards at the Asian mycology conference which was held in September in Lonquan, Zhejiang province, China. The Mycological Society of China and the BMS offered financial support for prize money and MiSAC provided the organisational expertise.

In January, the MiSAC treasurer was involved in leading a team of IPST professionals in Thailand to produce STEM microscopy activities. These were based on the use of *MuEye*, an instrument produced in Thailand, instead of traditional microscopes which are too expensive for many schools. The *MuEye* uses polypropylene lenses which are placed over the camera lens of a smartphone so that the object can be seen on the phone screen and photographed. Materials from sources suggested by MiSAC members were used to create STEM activities for work at primary, lower-secondary and upper-secondary levels. Using *MuEye*, the magnification and resolution of images produced were sufficiently acceptable for work at primary and lower-secondary levels. However, more-advanced microscopy activities require the better optics of traditional instruments.

The Microbiology Society [MS] (formerly the Society for General Microbiology) has continued with the development of its *Antibiotics Unearthed* project, inspired by the Small World Initiative, to discover new antibiotics produced by soil bacteria. MiSAC's Vice-Chairman has assisted in holding a summer school at Reading University for university and school staff involved in the project, together with a pre-pilot session in Norwich. He has also provided microbiology courses for PGCE students.

Other activities

The Chairman and Treasurer co-wrote an article, *Fungi in schools: a neglected potential*, for the School Zone section of the Microbiology Society

journal, *Microbiology Today*; 43 (1), 36-37. This was based on BMS-sponsored MiSAC competitions.

Future activities

The 29th Annual MiSAC Competition in 2017 has "Antibiotic Resistance" as its theme which will fit in well with curriculum specifications and current concerns, especially since research by the Wellcome Trust has shown that members of the public hold misconceptions about antibiotic resistance. In 2017, MiSAC will fund the costs of the competition. At the ASE annual conference at Reading University in January 2017, MiSAC and the MS will co-sponsor a lecture in the *Biology in the Real World: a Global Perspective* programme. In addition, the Chairman will provide a microbiological talk entitled *Roots, eats, soils and leaves*.

MiSAC hopes to organise an evening microscopy workshop for teachers and technicians at Reading University, with the cooperation of the Quekett Microscopical Club.

Acknowledgements

MiSAC is most grateful to its sponsors for their continued support. The generous amount of voluntary time, willingly given by the MiSAC Officers and the other Committee members, is also gratefully acknowledged. In addition, we greatly appreciate the work of the Honorary Auditor.

Committee membership 2015-2016 (with affiliations)

Chairman:	John Grainger (University of Reading)
Vice-Chairman:	John Schollar (NCBE)
Secretary:	John Tranter (ASE)
Treasurer:	Margaret Whalley (BMS)
Assistant Secretary:	Phil Bunyan (ASE)
Lay members:	Mary Philpott (CLEAPSS) Theresa Hudson (MS) Kit Brownlee (QMC) Martin Adams (SfAM) Clare Satchell (SfAM) Kath Crawford (SSERC)