Microbiologist

The magazine of the Society for Applied Microbiology ■ September 2003 ■ Vol 4 No 3 ISSN 1479-2699

Design-a-bug

What do *your* children think bacteria look like?

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What do *your* children think bacteria look like?

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Website: the society website is a timely source of up-to-date information on all Society matters and maintains a comprehensive archive of articles and reports on a variety of microbiological topics.

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Bugged by ignorance

FOR SOME REASON and for no reason I reminisced. About nothing in particular at first, but then finding myself trying to think about when I had first been bitten by the bug. I thought for a good while but struggled to recall any awareness of microbiology before late in my 'A-level' studies and thought it impossible that I could reach nearly eighteen without realising the true significance of microorganisms. Surely I must have forgotten, mustn't I? But as I allowed my mind to wonder further back in time I clearly recalled many earlier important educational and social milestones including getting my first pair of flares in 1973! So maybe I hadn't forgotten, I just hadn't been told and wasn't really aware.

A load of old rot

I'm delighted to say that the current curriculum does now recognise the importance of microorganisms both in their role as pathogens and the beneficial processes in which they are involved at a much earlier stage, through key stage 2 to 4 and post 16. The work of *Microbiology in Schools Advisory Committee* (MISAC) (http://www.microbiologyonline.org.uk/misac.html) is invaluable in promoting the teaching of microbiology in schools and helping teachers recognise the potential

of educational resources and advising on practical work. Each year MISAC runs a competition for schools which this year is sponsored by SfAM. The 2004 competition is entitled, *"Composting not just a load of old rot but a way to save the planet."* See page 31 for the competition details and page 28 for some of the 2003 winning entries. If you have children at school why not send this issue of *Microbiologist* to their teacher and get their class involved? Don't miss other opportunities in this issue for your family and friends to get involved with the Society and think about microbiology. Check out the 'Design-a-bug' cover feature on page 26 and enter the competition to win a fabulous Crayola® drawing set.

Flesh-eating bugs

In general there appears to be a lack of understanding and indeed misinformation about microorganisms that I think we can all contribute a little towards correcting. Education is the way forward. Microorganisms have tended to get a bad press and even more so with recent events highlighting their potential as agents of biological warfare. Many people dismiss their beneficial activities in global nutrient cycling and food, drink and pharmaceutical production in favour of their 'flesh-eating' capacities or ability to bring farming communities to the brink of collapse. I read somewhere recently that microbiologists were considered the 'suspects' or the 'saviours' depending on the circumstances…let's work together to make it the latter.

Erratum

The report of the international symposium on water borne pathogens (*Microbiologist* June 2003) was written by Dr. Leena Korhonen and not Peter Wyn-Jones as indicated.

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Out of the frying pan...

FROM: Chris Collins
SUBJECT: Bacon

If all bacon producers follow the precepts of the Danes we can enjoy our breakfast bacon without fears of salmonellas and AGPs. But I would enjoy it more if the rashers did not shrink to half their size and exude a great deal of gooey matter after a few seconds in the frying pan.

[I've wondered about this myself! Even the best quality smoked back "organic" rashers do this. Does anyone have any answers?- Ed]

Analytically challenged

FROM: Dr K R (Ken) Davey and David Ey
SUBJECT: Citation Analysis

We read with much interest the recent article on citation analysis by Sam Jaffe (*Microbiologist* March 2003, pp 30-31). We agree that citation analysis is a helpful measure of " …objective evaluation" and that if it is used as the sole criterion of a Research Assessment Exercise (RAE) "… (we're) just asking for trouble". However, we wish to highlight one related and important aspect of publication and citation that was not covered in the Jaffe article and to propose a simple, user-friendly, objective and quantitative formula that could help with definition of a rigorous criterion for research excellence in RAE-type exercises for publication and citation. We present illustrative examples for its use with both publications and citations. That there is a real and pressing need for our professions to find an agreed publication and citation method is briefly discussed.

Publications

Increasing the number of authors per publication has the apparent effect of an increase in the number of refereed publications each author can claim. It is not uncommon to now find as many as 6 and more authors per publication. That one author contributes 1/6 to 6 papers does not equate to 6 publications per author. To clarify what weighting might be given to multi-author publications we suggested a formula to calculate the number of Equivalent Single Author Refereed Publications, $N_{ESARPub}$ (Davey K R 2002 *Transactions of the Institution of Chemical Engineers*, Part A, **80** (4), 411 - 412). This is given as: $N_{ESARPub} = N_{RP}^2/N_A$ where N_{RP} is the Number of Refereed Publications and, N_A the Number of all Authors in N_{RP}.

Here we propose a simplified and alternative formula for $N_{ESARPub}$, namely:

$$\text{formula 1:}\quad N_{ESARPub} = \sum_{p=1}^{p=N_{RP}} \frac{1}{N_p}$$

where N_P is the number of authors per refereed publication.

Example 1. Assume an author in the early stages of a career with $N_{RP} = 3$. These consist of 2 single author and 1 co-authored paper with 1 colleague.

From (1) $N_{ESARPub} = (1/1+1/1+½) = 2.5$ (and not 3)

Example 2. Given $N_{RP} = 120$ in which there are 20 single-, 10 double-, 50 with 3- and, 40 with 4–, authors, then:

From (1) $N_{ESARPub} = 20(1/1) + 10(½) + 50(⅓) + 40(¼) = 51.6$ (and not 120)

Citations

We believe that this same formula can be used to objectively define the number of Equivalent Single Author Refereed Independent Citations ($N_{SAERICit}$), namely:

$$\text{formula 2:}\quad N_{ESARCit} = \sum_{p=1}^{p=N_{RP}} \frac{1}{N_p}$$

It should be noted that formula 2 is applicable to independent only citations.

Example 3. Assume that 3 single-authored papers, 2 double- and 7 with 4-authors of Example 2 are cited by unrelated and independent researchers. Then:

From (2) $N_{ESARICit} = 3(1/1) + 2(½) + 7(¼) = 5.75$ (and not 12)

Example 4. An established researcher has 10 publications each with 3 authors, and 7 publications with 1 author that are cited in an independent review article, then:

From (2) $N_{ESARICit} = 10(⅓) + 7(1/1) = 10.33$ (and not 17)

We believe the proposed formula, for both publication and citation, is intuitively correct since it reveals at a glance what fraction each contributes to a multi-author paper. Importantly, it can be readily seen that there is no incentive or advantage in increasing the number of authors on any refereed publication. Used carefully (e.g. check on research groups self-citing) the formula would reflect quantitatively something like the real contribution to the published literature of each. The computation can be readily done – either by hand-held calculator or in a spreadsheet or database (as we find is convenient and we already do).

The formula could be further refined by directly including a weighting, based on the quality or standing of a particular journal, and possibly different for each research specialty, in the summation.

We agree with Sam Jaffe that in the future we will be subjected to publication and citation analysis. We should therefore realize that we must have an input into the methods – or we will have them imposed by funding or government agencies. It really ought not be beyond the capacity of professional scientists and engineers to provide a substantive index for a RAE-type exercises that would be widely accepted and used. Indeed this would address a real and an emerging self-need.

A pat on the back

FROM: Bob O'Callaghan
SUBJECT: *Microbiologist*

Just a quick email to congratulate you on your excellent magazine which I picked up at the ASM. I would particularly like to thank the backroom boys who produce *Microbiologist*. I spent some years putting together a journal in my youth so I know how hard it is to combine copy, pictures and tables to communicate information in an attractive and readable way and your team deserve top marks!

Thank you to all entrants of the microbreak **double trouble** June quiz. The popularity of the quiz was such that it outgrew the capacity of the lab-coat pocket and a large autoclave bag was used instead. Entries were received from around the world, notably from Israel, India, Japan and Jordan. The winning entry was provided by **Mr Richard Potter** from Profile Drug Delivery, West Sussex who wins a £30 book token for his efforts. Well done Richard!

Code Breaker

Here is a new type of quiz to help you while away those incubations. Break the code to reveal the hidden message. All correct entries received in the Society Office by **Friday 24th October** will again be stuffed into the editor's lab-coat pocket (or autoclave bag!) and the winning entry drawn by an independent referee. The answer will appear in the December issue. Once again, a £30 book token is the prize.

Answers to the June Microbreak

Salmonella
Escherichia
Campylobacter
Vibrio
Pseudomonas
Treponema
Xanthomonas
Zoogloea
Rhizobium
Neisseria
Moraxella
Klebsiella
Erwinea
Proteus
Staphylococcus
Clostridium
Propionibacterium
Rhodobacter
Mycoplasma
Listeria
And the hidden word was...
Microbiologist!

Code Breaker Quiz

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
								W				J													

M I _ _ _ _ I _ _ _ _ _ I _ _ _ _ _ _ _ I _ _ I _ _ _ _ _ _

J W I P T U W T C T D W S X S B T W X W L X Q O

_ _ _ _ _ _ _ _ _ _ _ _ I _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

C F U T P F X T P R M W X Q I A C X A P O F L B

_ _ _ _ M _ _ M _ _ _ _ _ _ _ _ _ _ _ _ M

F P O J O J U O P S T H S H F J

A £30 book token is waiting for the person whose entry is drawn from the editor's lab-coat pocket first! The closing date for entries is **Friday 24 October 2003**. The answers will appear in the next issue of ***Microbiologist***.

Name: _____

Address: _____

Simply photocopy this page and send it to: 'Microbiologist Code Breaker Quiz',
Society for Applied Microbiology,
The Blore Tower, The Harpur Centre, Bedford MK40 1TQ, UK.

Remember, you could win a £30 Book Token!

New Members

We would like to warmly welcome the following **new members** and hope that you will participate fully in the activities of the Society.

Australia

Professor H J Fallowfield; Dr N J Rogers; Dr D A Veal

Brazil

Dr B Stambuk

Cayman Islands

Ms A Johnson

Ethiopia

Dr J Search

France

Mr A Blackwell; Professor P Lebaron

Hong Kong

Professor P-K Wong

India

Dr P Dargan; Mr S Pai

Iran

Mrs S T Dalir; Dr M R Soudi

Italy

Dr G Spano

Japan

Dr C A Asis; Mr K Shima

Mexico

Dr R Cruz Camarillo

United Kingdom

Mrs C C Anyanwu; Mr B Bahrami; Mr I Bamforth; Miss A Brown; Miss K E Brown; Miss R Buck; Mrs O Chymera; Mr N Clarke; Mr L Cosgrove; Mr L Darkwah; Miss K Duangmal; Mr J I Elzwai; Ms J Evans; Mr D Ferrett; Dr P Fuchs; Miss T Gallagher; Mrs C E Gallagher; Miss R Guppy; Miss M E Hope; Miss G Hughes; Mrs H F Joliffe; Ms T J Karpanen; Dr M A Kertesz; Dr Z Khodaii; Dr E Komitopoulou; Dr A J Lawson; Dr D McCleery; Miss G Moore; Mr S More; Mr C N Pandya; Mr W Pathom-Aree; Mr T Puehmeier; Dr E Rappocciolo; Miss J Rollason; Miss A K Rowan; Mrs N J Senior; Miss R L Smith; Dr J P Taylor; Ms D Vicente; Dr A M Webster; Mr P Wheat

U S A

Dr F Balaa; Mr D Robbins

the President's Column

Dr Peter Silley calls for greater members' involvement in planning Society meetings, discusses the implications of the 'European Declaration for Microbiology' and reviews the House of Lord's recent report "Fighting Infection".

I WAS RECENTLY asked whether *Microbiologist* might be published more frequently than once a quarter, well it might be, but not in the short term. The work involved is considerable and that only relates to writing this column! I do want to say a big thank you to Anthony for the way *Microbiologist* is developing as a publication of the highest order, all his efforts are truly appreciated.

There are a number of matters I wish to touch on in this issue but I guess I must first address the cancelled Summer Conference. Sincere apologies are extended to all those who were affected by this decision. Unfortunately we had no option but to cancel the meeting due to the lack of registered delegates. Committee have considered the reasons and we have put into place new procedures to ensure that to the best of our abilities, this will not happen again. What is clear is that the programme was not sufficiently attractive to the microbiology and engineering communities. We therefore need to enter into a more meaningful dialogue with our members to ensure that our meetings programmes are relevant and attractive. *Microbiologist* and the interactive Forums on the new website provide appropriate means to make your views known so please use them.

This leads me on to the letters we received which were published in the last issue concerning the Society's proposed ethics statement. Thanks Bob, we have taken your point on board and are not planning to make acceptance of this statement conditional upon SfAM membership. We would, however, commend to all our members the recently launched, "European Declaration for Microbiology" which was accepted by FEMS member societies at the successful first Congress for European Microbiologists held in Ljubljana earlier this year.

I was pleased, as President of SfAM to sign the declaration on behalf of the Society and despite its length believe it is appropriate to reproduce the Declaration in this column.

The Declaration presents to the General Public, the policy makers, the scientific community and our colleagues the viewpoints and goals of FEMS.

Microbiology, the science of microbes (viruses, bacteria, algae, protozoa and fungi) has a long and continuing tradition in Europe since Antonie van Leeuwenhoek working in Delft inThe Netherlands, first reported his observations of algae, bacteria and protozoa to the Royal Society of London in 1676.

In the last 200 years European scientists, such as Louis Pasteur, Robert Koch, Sergei N. Winogradsky and Martinus W. Beijerinck, have made most of the seminal advances in microbiology and rate as highly as scientists in any other field of discovery. This strong tradition of excellence in European microbiology continues today, European microbiologists continue to contribute to the most important advances in medicine, agriculture, biotechnology and basic sciences.

Microbiologists world-wide have organised themselves into scientific societies. In Europe microbiology societies are fragmented by country on the one hand and by discipline on the other; they have separated into subject-related groups of virologists, bacteriologists, algologists, mycologists, protozoologists and parasitologists and into vocationally related specialities such as medical, food, agricultural, environmental and industrial microbiologists.

It is the aim of this declaration to begin a process that will provide a focus for and unify European microbiology. Only in this way can microbiologists serve our community of fellow scientists, politicians, industrialists and the general population of Europe to the best of our abilities. Such cohesion will enable us to compete successfully in an international marketplace and to strive to lead the world in standards of scientific rigour and integrity. Realizing that we can do more together than separately, FEMS aims to become the nucleus for such cohesion. Let the beginning of the 21st Century and the fifth Century in modern microbiological research be the starting point for real cohesion and increased scientific cross-fertilization amongst microbiologists in Europe!

This declaration aims to initiate debate amongst European Microbiologists to establish mechanisms by which European harmonisation and, hopefully, in the future unification of microbiology can be achieved. We must do this without harming the rich diversity of microbiology in Europe. It is this diversity which will generate tomorrow's Nobel prize winners and stimulate the expanding influence that microbiologists should have on technological, scientific, political, social and environmental thought in Europe.

FEMS believes that this declaration should stimulate the following issues:

1. To ensure that Microbiology serves the welfare of mankind, allows sustainable development for all people, ensures the protection and preservation of nature and helps achieve world peace.

2. To enhance the public awareness of the benefits of microbes to the world and mankind, and the understanding that the dangers posed by microbes are few and vastly outweighed by their benefits.

3. To ensure the access of all Europeans to accurate information about microbiology, including the availability of pertinent literature, and its benefits and threats to humans and our natural environment.

4. To support the understanding and preservation of microbial biodiversity, by research and the maintenance of a network of microbial culture collections.

5. To condemn the deliberate use of microbes to the disadvantage of humans (biological warfare and bioterrorism).

6. To ensure that the teaching of microbiology should be part of all European educational systems, and be fully integrated into scientific and social education, at all levels. To encourage microbiologists to communicate with the public about their work and the importance of microbes.

7. To encourage the highest standards of safety in all microbiological processes, products and procedures. To ensure that technological advances arising from microbiological research are thoroughly tested before exploitation .

8. To make certain that microbial genomic data are to be considered the heritage of all humanity and are available to all mankind.

9. To nurture European microbiology by increasing mobility of researchers within Europe, and retaining the best microbiologists in Europe, by providing frameworks to ensure that strong microbiological research takes place in Europe in universities, hospitals, government and industrial laboratories.

10. To support the potential growth areas of microbiology such as biotechnology, foods microbiology, rapid diagnostics and environmental protection.

FEDERATION OF EUROPEAN MICROBIOLOGICAL SOCIETIES
FEMS

There are many challenges ahead and I trust that we will be able to play a leading role in working towards these commendable objectives.

I cannot close this column without referring to the publication of the House of Lord's Selection Committee on Science and Technology report "Fighting Infection" (see box). SFAM submitted evidence to the Select Committee and I was pleased to read the conclusions. I cannot do better than pick out some phrases in the Comment section of *The Veterinary Record*, Volume 153 (4).

"The report makes much of the need to strengthen collaboration between all those involved in fighting infection. It points out that many emerging human infections are zoonotic and that, in order to predict possible outbreaks more accurately, collaboration between specialists in human and animal infection is essential. It draws attention to the role of wild and companion animals, as well as livestock, in infection, and to concerns about a lack of surveillance of these species.

Despite the requirements, and the efforts being made to improve collaboration, the report paints a picture of a system that is under-resourced and, in many respects, fragmented. It notes that responsibility for surveillance is spread across a number of agencies, which rely on different databases. Often, information between laboratories cannot be shared because they do not have common data sets or standards. Also, the report says, surveillance in animals is usually driven by concerns about the economic impact of infection in animal rather than public health. As a result, 'an organism which does not cause an animal ill health and has no adverse economic impact in relation to agriculture, such as *Campylobacter*, is often not investigated, even though it may cause considerable illness in humans', highlighting the need for a 'joined-up' approach, the report recommends that the recently formed Health Protection Agency 'be provided with resources to take on specific and primary responsibility for integrating surveillance related to human, animal and foodborne infection at national, regional and local levels, in order to bridge the gaps that currently exist between these areas of speciality.' Noting that lines of communication and accountability are unclear, it further recommends that the minister for public health should publish, as a matter of urgency, a document outlining the roles and responsibilities of all organisations involved in infectious disease services, and should disseminate this to everyone concerned."

I look forward to learning how Government will respond.

Peter Silley

'Fighting Infection'

■ Copies of this report (reference HL Paper 138) are available from The Stationery Office, tel: 0845 600 5522, price £12.50. Alternatively, it can be downloaded from: www.publications.parliament.uk/pa/ld200203/ldselect/ldsctech/138/138.pdf

SfAM at the ASM 2003

Lynne Boshier reports on the Society's successful presence at the 103rd annual ASM meeting in Washington DC in May 2003

Dr Peter Silley (Hon President), Alan Godfree (Hon Editor JAM), Lynne Boshier (Events & Office Manager) manned the SfAM stand at the 2003 ASM (American Society for Microbiology) meeting.

After a non-eventful flight I arrived safely in Washington DC, the venue for this year's ASM meeting. Staggering through customs with large cartons & boxes of SfAM pens, give-aways and paperwork (as US Customs had advised that we could not ship this in advance this year due to tightened security) I was amazed to be waved straight through with no questions asked at all!

We were very concerned at one point that our SfAM display stand would not be released by US Customs as we had shipped that over in advance and were subsequently advised that it looked 'extremely suspicious'! A number of suggestions were received about other ways in which we could attract visitors to our stand - most of which could not be printed here – but one of which was that we turned our stand into a bagel shop as anything with food appeared to have endless queues all day! However, at the last minute our stand was released and we were able to set up our booth.

The new Washington Convention Centre is huge and the exhibition area stretched for what seemed like miles. Needless to say, all the suppliers were at the opposite end of the hall from our stand so by the end of the day I had certainly walked off my breakfast! There had been a change of layout by the ASM organisers just beforehand and our stand was in a very good position, on the corner of a main walkway and close to the publisher's area.

We were kept very busy throughout the 3½ days and had to ration the journals and the SfAM highlighters which were literally going like hot bagels! In fact, during the quieter moments we ran competitions between ourselves to see exactly how long it would take for the give-aways to be decimated.

As always, there was huge interest in our journals – both for reading and publishing work, but of particular interest this year was the on-line submission of manuscripts. Alan Godfree – Hon Editor of JAM - was on the stand throughout and was able to provide detailed information and answers to the many questions we received.

The excellent *Microbiologist* proved extremely popular and many flattering comments were received about the quality of our member's magazine – luckily we had taken 4 large cartons of these with us, which were available on the stand.

Many members came by just to say "hello" or introduce themselves which is always a delight for us, as it's nice to put faces to names. Thanks to all who took the time. It was a very good visit and SfAM I'm sure will benefit from the exposure we receive at meetings like this.

In our limited spare time, we explored DC but sadly the usual warm spring weather had deteriorated and become chilly, grey and rainy – home from home in fact. Nevertheless we explored some of the main tourist sights and of course, had to check out the shopping!

Finally, on the last day we had the excitement of a George W Bush visit to the centre for an early evening dinner engagement. The skies were choc-a-block with helicopters criss-crossing over the building and we spent the afternoon surrounded by dozens of burly FBI men in dark suits, talking into their shirt cuffs and looking suspiciously at everyone. It was just like the movies!

Lynne Boshier
Office and Events Manager

society for applied sfam microbiology

Not a member?

The many benefits of membership are explained on page 50 where you will also find a reply card to request further information about the Society and its activities.

If you would like to join us please visit our website at www.sfam.org.uk where you can apply for membership online at the click of your mouse.

JAM and LAM climb the impact factor ratings

The impact factor of the *Journal of Applied Microbiology* (JAM) has risen from 1.479 to 1.819, putting it 35th in the Microbiology category, compared with 46th last year, and 41st in the Biotechnology and Applied Microbiology category, compared with 51st last year.

Letters in Applied Microbiology (LAM) has risen from 1.151 to 1.182. It is now 54th in the Microbiology category and 59th in the Biotechnology and Applied Microbiology category, compared with 60th last year.

Online article access

Since the introduction of online article access to JAM & LAM the readership of both journals is healthy and growing. This is excellent news and the journals are on target to exceed the number of downloads for last year.

The table shows the total 2002 online article accesses and the number of articles accessed from January to June 2003 for both journals.

Journal of Applied Microbiology

Source	Total 2002	Jan - June 2003
Ingenta	3,656	3,500
Ebsco	2,514	3,774
Total Synergy	91,014	58,774
Other	750	578
Total downloads	97,934	63,551

Letters in Applied Microbiology

Source	Total 2002	Jan - June 2003
Ingenta	1,223	1,295
Total Synergy	45,073	27,314
Other	316	87
Total downloads	46,612	28,927

Sponsor a new Member and win a £50 Book Token!

Could you be the next winner of the 'sfam Sponsor of the Year' Award?

If you feel you could be our next winner for 2003, and would like some promotional material to help you recruit new members please contact Julie Wright, Membership Co-ordinator on 01234 326661 or email julie@sfam.org.uk.

Caption Competition

WIN A BOTTLE OF BUBBLY!

With the popularity of the caption completion in the March issue of *Microbiologist* we couldn't resist throwing this picture of our Hon editor of JAM at the ASM meeting to your mercy. **The member who submits the most original and amusing caption in 15 words or less to accompany the photograph will receive a bottle of champagne.**

To apply, send your suggestion by email to a.c.hilton@aston.ac.uk or enter it in the space provided on the reply card at the back of this issue. You don't even need to buy a stamp if you post the card in the UK! **Closing date for entries is Friday 25th October 2003**, so get creative and send in your entry!

Hon editor of JAM, Alan Godfree 'manning' the SfAM stand at the ASM...

Dr David Kelly remembered

The career of David Kelly tells the tale of a microbiologist who had an illustrious track record both as a research scientist in his early years and latterly as a weapons inspector working for UK Government and the United Nations. David Kelly graduated from Leeds University and after completing his doctorate at Warwick University worked at the former Institute of Virology in Oxford, pioneering the development of molecular techniques for the analysis of viruses. He was rapidly promoted to become an Individual Merit scientist, status only conferred on the most able researchers in government research laboratories and he published widely in learned scientific journals becoming an internationally recognised scientist in his field.

Professor Rick Titball, group leader for microbiology at the Defence Science and Technology Laboratory (Dstl) site at Porton Down remembers working with Dr Kelly for 10 years. "His appointment as the Head of Microbiology at Porton Down marked the start of an era which has changed the face of biological warfare defence in the UK.His enthusiasm for science transformed the research programme. Equally importantly, he correctly judged that the threat from biological weapons was likely to increase and he successfully persuaded MoD to invest in additional research to defend against these weapons."

The Gulf War marked a change in the mission of David Kelly. His involvement in activities to monitor the possible development of biological weapons convinced him further of the essential need to rid the world of these weapons, and during the past ten years he spent long periods overseas as asenior weapons inspector. His legacy lives on today and most importantly in those scientists he guided towards success and who will continue his mission."

Could YOU benefit?

Did you know that the Society has many generous grants and prizes available to members? To find out if you are eligible and could benefit visit the website at:**www.sfam.org.uk**

running on empty?

A number of people have enquired about the availability of refills for the Society rollerball pen that was provided to members with the December 2002 issue of *Microbiologist*. You'll be glad to hear that refills are now available from the Society office for £1.25 inclusive of postage & packing.

Lost Members

Does anyone know the whereabouts of the Society members listed below? They are paid-up members of the Society for whom we have no current address.

Retired Members

W R L Brown; J C Dakin

Full Members

J P Eccles; R Lambert; D K Necklen
J A Parr; M Wilkinson

JAM & LAM go OnlineEarly

From August 2003 *Journal of Applied Microbiology* and *Letters in Applied Microbiology* are set to move to ***OnlineEarly*** publication. This will mean that articles that are ready can be published online ahead of the print journal which will effectively reduce publication times. Coupled with online submission of manuscripts this makes our Society journals even more attractive to potential authors.

OnlineEarly is an enhancement to the Blackwell *Synergy* service where fully corrected, fully functional and complete articles are published online as and when they are ready, prior to their ultimate inclusion in a print issue. Several publishers offer ahead of print services but not all have searchable full-text HTML as *OnlineEarly* does. A few services offer only uncorrected preprints of articles but *OnlineEarly* is a true 'finished article' service - with fully functional, complete and searchable articles in HTML with active links and journal format PDF for download if that is preferred. Although *OnlineEarly* articles do not have bibliographic information associated with them (i.e. Vol./issue numbers, page ranges), they can still be cited by means of their DOI (Digital Object Identifier). This number will stay with the article throughout its life, even when it has been published in a print issue. Therefore, citations that were made before an article was published in print will still enable readers to access the article when it has been moved to its final issue.

How does *OnlineEarly* work?

Accepted manuscripts follow the standard production process up to receipt of the corrected proofs from the author, however, instead of waiting for the scheduled date for issue make-up, marked proofs are returned to the typesetter immediately for correction on an article-by-article basis. The typesetter then returns a revised PDF to the Production Editor for final checking. On approval of the proof, the typesetter supplies electronic deliverables for the article to Content Management. It is then placed live in a specific *OnlineEarly* 'issue' on *Synergy*. Articles accumulate on *Synergy* until the Scheduled issue make-up date. At this time, the Production Editor decides which of the current articles are to be used to make up the next issue.

What does *OnlineEarly* look like?

In the List of Issues for each journal, the *OnlineEarly* current articles issue appears as a link above the current volume. Clicking on this link displays the list of current articles in a format similar to a regular *Synergy* issue. The differences from a normal *Synergy* issue are the lack of bibliographic information and the addition of the DOI and the online publication date to each article. The DOI provides sufficient information to allow other authors to cite the paper in another publication without waiting for Volume and Issue numbers.

For more information about *Synergy* please visit the Society website where you will find links to take you to the *Synergy* journal homepages and *OnlineEarly*.

Hilary Hearnshaw uses some fictional scenarios to highlight the very real and complex problems involved in getting funding for academic research

Research funding dilemmas

The lecturer's tale

I AM A MICROBIOLOGY LECTURER in a university department. So far, I have gained one research grant for a project that I lead. Academic colleagues in my department are co-researchers on this project. I have a full time research

associate working with me on the project, whose contract has just nine months to run. Unless I can get another research grant to fund her, she must soon start looking for another job. I see a call for proposals for research that would fit well with the work we are doing now. We want to do that, and we can do that. So we generate a design for a research project and submit it as a proposal. The proposal would fund me for a proportion of my academic time for two years and my research associate full time for two years.

Writing this proposal takes six working days of my time, six days of the research associate's time, three days of secretarial time, and half a day of university finance office time to check and approve the figures. The deadline for proposals is tight because that is the way the funding bodies work. The total cost of preparing the proposal is about £3000, which mostly comes from our current research project funds, paying the research associate's salary now and contributing to the finance office through overheads taken from our grant.

Our proposal has failed, but we do not know why. The funding organisation gave us no feedback on why our application was turned down, so we don't know how to improve. How can we avoid repeating all this?

We never see any of the successful proposals, so we can't even learn from other people's successes (Bandura, 1977). It all feels a bit of a lottery, although I do not want to believe this.

I'm not sure we can afford to prepare another proposal, but nor can we afford not to. We need to raise money for my researcher to keep her job. She can see no security in a career in research, and she is right. I cannot guarantee her anything.

Like most academics, I have had no formal training in research project management. It feels as though I spend about 40% of my research time writing proposals saying what we are going to do, 40% of my time writing papers saying what we have done, and only 20% of my time thinking and doing the research. That seems out of balance.

The research associate's tale

I HAVE WORKED FULL TIME on this two-year project for 15 months, and there are just nine months left on my contract. After that, nothing is guaranteed. I was encouraged by a new EU directive, which promised to ensure that fixed term employees are treated as fairly as permanent employees (Solesbury, 2001). Unfortunately, that does not mean very much since there are few permanent employees in my department below the grade of professor.

Everyone is on fixed term research funding. Universities claim that they must use fixed term contracts for research staff because their income is uncertain. However, this is difficult to justify, since most of our economy works on uncertain income. Why should universities, whose core business includes research, an activity based on uncertainty, be a special case? I was optimistic about the latest proposal we submitted. Another two years of funding would have meant that I could have been a little more secure in my future and maybe looked to buying a house. Obviously my optimism was unfounded.

The awards coordinator's tale

I AM THE AWARDS COORDINATOR in an organisation that supports research in medicine and health care. The exact topics we support are decided each year by our board of experts. We advertise the awards widely twice a year and get many applications each time.

I recruit expert reviewers to advise the research committee on which applications to fund. It costs thousands of pounds to administer and manage this. We keep to tight deadlines because that is what researchers like. I don't have enough resources to do all that I would like to do, and one thing I regret is that we cannot give any feedback to the unsuccessful applicants.

We are fairly sure that our peer review process is not biased (Wessely, 1998) but some reviewers do not provide very kind reviews on some applications and the board fears that providing feedback to researchers may lead to appeals. It is difficult to be sure about the quality of my reviewers and how to interpret what they say, but I soon get to know about their reliability and ability to meet deadlines. We try to get a range of reviewers to present differing viewpoints, but that often just increases the difficulty in reaching consensus on the decisions.

We probably do not owe the unsuccessful applicants anything many of them have wasted our time. We were offering them a favour. We do not promise feedback. We must focus our resources on supporting the projects we decide to fund so that we get answers to our research questions (Pencheon, 1999). Perhaps we can learn from other research funding organisations on how best to meet the needs of the NHS and provide research governance (Department of Health, 2000). The review of research councils (OST, 2001) should bring us some useful information on researchers' views of the process.

The reviewer's tale

AS A REVIEWER for the research funding organisation, I am asked to give my opinion on research grant applications. Twice a year I am sent 12 applications, and I have three weeks in which to review them. The deadline for reviews is tight because that is what funding bodies and researchers like. I read the applications carefully because I know from my own experience how much effort goes into preparing a proposal. I want to do the task justice. It takes me about two hours to read and report on each proposal. I receive no financial reward.

My report is read by members of the research committee and used to inform their decisions. At least, I assume that is so, but I am not told how the decisions are made nor what the results are. I do know that the administrative resources are low. They cannot even afford to send my comments to the applicants. Nor do I get any feedback on my review. So, no one will use my opinion again once the decision has been made, which seems a waste.

Reviewing can also be very boring. There are some awful proposals submitted. Doesn't anyone teach people how to write a good proposal? They certainly have not taught me how to do reviews. Sadly, no reviewer is perfect, but we can all improve. I have no idea whether I am wasting my time. I don't even get any thanks.

The university research finance officer's tale

I AM ASKED TO CHECK the figures of research grant proposals to ensure that the university can support what is proposed. Normally, academics come to me at least 24 hours before the deadline for submission, so we have plenty of time (they tell me) to make corrections and get all the required signatures. Of course, it would be much easier for everyone if I was asked at the start of the process of preparing a proposal, so that errors could be prevented and we could work at sensible speed. Researchers seem surprised that people in the research office, who must sign proposals committing the university to large amounts of money, often want to read what they are signing.

Our academics are confident that preparing their proposal has been a good use of time and that, ultimately, we shall all benefit. It seems to me a poor use of everybody's time to produce detailed budgeting at the first submission of a proposal. Surely a proposal could first be assessed for its research quality, with only an outline funding budget in an initial submission. If the research is good enough then we could work on the details of finance. I suppose that might put me out of a job, though...

Commentary

SADLY, THESE FICTIONAL CHARACTERS are based on realities. Is this really the way to get the best research projects? Is this really the way to develop a high quality research culture? Can we improve things? Of course we can, and some funding bodies are improving. A good start would be to use a transparent process for awarding research grants which would be both evaluative and educational. With this, the funding body would still get the best projects. Unsuccessful applicants would get at least some reward by way of information and feedback for their efforts. Their next proposal could then be better, and the quality of research overall would improve. Reviewers would be nurtured and valued and be able to contribute positively to the culture of research. We all, as taxpayers and charity supporters, would get better value for money from research.

Are research funding bodies looking seriously at the cost effectiveness of their processes? The current review of the research councils will provide some answers for those councils, but there are many other funding bodies. Which funding body has the most cost effective process? There are many different processes in use, so some must be better than others. Do research funding bodies want to know this? Would a proposal to

study their cost effectiveness be funded by anyone? The irony of the lack of controlled trials of factors in the funding decision making has been pointed out (Wesseley, 1998) but not yet acted upon. Would a proposal to do this research get through any of the funding bodies' processes?

Hilary Hearnshaw
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Based upon and reproduced with kind permission from an article originally published in *The British Medical Journal* 2001; 323: S2-7324

Please email the editor **(a.c.hilton@aston.ac.uk)** if you want to continue this discussion

References:

- Bandura, A (1977) *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.
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Joint Health Protection Agency / SfAM Training Initiatives and Health Protection Agency Food Microbiology Traning Programme 2003/2004

The need for a coordinated approach to training for food microbiologists has been recognised by the Health Protection Agency as part of a wider strategy for training. A series of Food and Dairy Microbiology training days have been organised for 2003/2004 to be held at HPA, Colindale. The days have been designed to focus on the training needs for different professional groups of Food Water and Environmental (FWE) microbiology staff and delegates will be attending from HPA FWE laboratories and FWE laboratories in NHS Trusts. The HPA would also like to invite SfAM members to take part in the 2003/04 training programme (although priority will be given to HPA staff). The cost will be £80.00 per delegate per day.

Training Programme 2003/2004

Fri 17th October 2003	**Basic Food and Dairy Microbiology** - for BMS 1-2 MTO 1-2 and new clinical scientists.
Tues 25th November 2003	**Applied Food and Dairy Microbiology** for Food Examiners, BMS 2-3 MTO 2-5 and clinical scientists.
Tues 3rd February 2004	**Legal Training Day** for Food Examiners and staff training to be Food Examiners.
Tues 16th March 2004	**Workshop on Outbreaks, Audits and Interpretation** for staff training to be Food Examiners and new Food Examiners (numbers limited to 40 as this will be a workshop format)
Tues 29th June 2004	**Advanced Food and Dairy Microbiology** for Food Examiners, BMS 2-3 MTO 2-5

Contact

For further details of the courses and an application form please contact: Farah Nazima, Leaning Education and Development Division, Health Protection Agency, Corporate Services, Colindale, 61 Colindale Avenue, London, NW9 5DF.
Tel: 020 8200.1295. ext 3625. Email: farah.nazima@hpa.org.uk. Please indicate if you are a member of SfAM
For any specific enquires about the programme please contact: Dr Isobel Rosenstein, Scientific Development, Health Protection Agency, Corporate Services, Colindale, Tel:020 8200.1295. ext 3921. Email:Isobel.Rosenstein@hpa.org.uk

Preliminary work is now underway to produce a joint HPA/SfAM training programme for Food Microbiologists in 2004/05. The HPA is looking forward to these future collaborations.

Education in Ethiopia

Lake Awassa and the city from a nearby hill called Allah Amoura

Further Information

- This is the first in a series of journal reports from Jenny. If you can't wait until the December issue of *Microbiologist* for the next instalment you can find out more about her activities and see some more photos at www.neal-jenny.info
- For more information about VSO, see www.vso.org.uk.
- The Faculty of Natural Sciences at Debub University also has a website at http://home.no/dufns

I ARRIVED IN ETHIOPIA on Feb 2nd this year to work for two years as a Voluntary Service Overseas volunteer. My role here is as a Biology Instructor at Debub University in Awassa. Lying 275km south of Addis Ababa, Awassa is the capital of the Southern Nations Nationalities and Peoples' Region (SNNPR).

Debub University was formed in 2000 from the amalgamation of three higher education institutes in the region. The Faculty of Natural Sciences was formed last year and offers four-year degree courses. I am working in the Department of Applied Biology and my partner Neal is also here working in the Department of Applied Physics.

Before coming here, I completed a Ph.D. and B.Sc. in Immunology at the University of Glasgow. My PhD work was carried out in the Division of Infection and Immunity under the supervision of Professor Tim Mitchell. I investigated pro-inflammatory mediator production by pneumolysin, a pore forming toxin produced by *Streptococcus*

Educational provision and standards in Ethiopia are quite inadequate and educational structures badly run down, with acute shortage of materials. A high proportion of teachers are either incompletely or poorly trained and teaching methodologies are old fashioned. The education system is trying to develop different and appropriate methodologies and the education bureau is providing training but it still requires a lot of effort and new skill input to bring significant change. **Dr Jenny Search**, a microbiology & immunology graduate of Glasgow University signed up for a two-year voluntary service overseas (VSO) placement to bring some much-needed expertise to Debub University.

Learning how to use microscopes

pneumoniae. Whilst finishing my thesis I spent six months working at the Beatson Institute for Cancer Research. During that time I decided I wanted a change from Glasgow and applied for a placement with VSO. The process went through very quickly and six months later I found myself here!

My job here is partly to "Gap Fill" as there is a lack of qualified teachers in Ethiopian Universities. The other aims of my placement are to help develop new courses for the upcoming 3rd and 4th year students and to assist my colleagues in starting research projects.

Teaching

Amharic is the official language of Ethiopia, but over 70 languages are spoken in this region alone. Luckily for me, English is used as the medium of instruction in Ethiopia from secondary school. The students still receive lessons in the English language throughout their time at university. In the first year of the Faculty of Natural Sciences there are about 1,050 students who all take introductory courses in Biology, Chemistry, Physics, Maths and Geography. At the end of their first year they will choose one of these departments in which they will complete their degree.

Teaching an introductory course has been interesting. I've found myself teaching subjects I haven't taken since my own first year at university! I've certainly had to brush up my knowledge of photosynthesis.

I am currently teaching two first year (freshman) classes, each consisting of 150 students. After a couple of lectures of completely blank faces, the students started to get used to me (and my accent) and I to them. I was worried a class of this size would be quite daunting but the students are very quiet and studious and there is generally a great deal of respect for teachers.

As the Faculty is new – two years old – there are currently only first and second year courses running. In October the present second years will become third years, so over the summer break I will be involved in designing those courses. I am looking forward to this as I will be involved with courses I know something about i.e. microbiology, parasitology, molecular biology etc and I will also be involved in designing the practical classes to go with them.

Research

One of the difficulties for would-be scientists here is that, at present, there is only a limited PhD programme in the country which is available in Addis Ababa University. Most Ethiopians wishing to study for a doctorate have to leave the country. This exacerbates the problem of educated people not returning to their home country once they have left - the so called "brain drain". There are some sponsorship schemes (for example a Norwegian scheme called NORAD) that fund Ethiopians to spend two years carrying out research here and then two years in Norway to analyse data, use equipment not available to them at home and to write this up. Under this scheme if the student does not return to their home country the scholarship becomes a loan which must be repaid. The staff do have some research experience as they have completed MSc courses at Addis Ababa University. I have set up some "research meetings" with some colleagues who have an interest in microbiology. We have come up with three small projects which we hope to be able to start with the equipment we already have. We are busy writing proposals for small amounts of funding to buy media etc so we can make a start. The three research projects we hope to start are: bacterial analysis for food poisoning organisms in fruit juices or other foods in local cafes/restaurants, analysis of the microbial quality of drinking water in Awassa and biodiversity of microorganisms in local hot springs. I am also planning on trying to develop some collaborations with interested laboratories abroad.

It is quite a challenge for me to think of experiments that do not involve any of the equipment I previously took for granted. There is no equipment to carry out any kind of molecular studies. What we do have is an autoclave, a few incubators, a wooden hood that can be used for sterile work i.e. it has a hole in the bottom that a Bunsen burner can fit in to. There is a fridge/freezer but no -80°C or liquid nitrogen storage facilities.

Electricity is another problem – or rather the lack of it! In Ethiopia, the majority of the electricity is generated by hydropower. Although we have had plenty of rain in Awassa, this was not the case for most parts of the country. This means our one no-electricity day has recently increased to two. Countrywide the electricity is turned off from 6 am until 10 pm for two days of the week. I can see this being a problem for storing microbiological samples. However the local public health laboratory records show the temperature stays fairly constant if the fridge/incubator is not opened on days when there is no power. On the plus side, my colleagues are all highly motivated and keen to do research so hopefully we can begin to overcome these problems.

Unfortunately, the only practical microbiology I've carried out so far has been the unintentional culture of amoeba in my own digestive system!

The classrooms in the new campus where the first years are taught. The rooms in this building will become laboratories when the rest of the classrooms have been built.

Downstream of the source of a hot spring at Wondo Genet. One of the sites where we hope to study the diversity of microbes in a hot-spring environment. This water is also used to fill a swimming pool at the bottom of a hill which is like a hot bath and very relaxing!

Jenny Search
University of Glasgow

society for applied sfam microbiology

Microbial Interactions with Medical Devices: a matter of life & death

7 - 8 January 2004, Marriott Hotel, Gosforth Park, Newcastle, UK

This Meeting has been awarded CPD accreditation to the value of 1.6 CREDITS

OVERVIEW

The acquisition of infections from contaminated surfaces is an age-old but increasingly relevant problem. From the home to industry and healthcare, surfaces play a critical role in the transmission of disease and contamination in many environments.

The development and increased use of medical devices has undoubtedly been of great benefit to patient care. However, inappropriate use and care of devices can increase the risk of infection leading to increased mortality, prolonged hospitalisation and increased costs. The causes and prevention of microbial contamination of surfaces involve a wide variety of organisms and strategies.

This meeting will address both the current areas of concern associated with contamination of medical devices and the application of new technologies to prevent and/ or control microbial contamination of surfaces.

The programme will include special sessions on ophthalmic and dental devices, and 'smart' surfaces.

CALL FOR PAPERS

There will be an opportunity during the meeting to present offered papers and posters. We will be pleased to receive ideas for offered papers and posters in all relevant subject areas.

Abstracts should not exceed 500 words and the contents should include the aims and objectives of the work, brief methodology, results, conclusions and impliactions for the work. Please indicate whether you prefer a poster or oral presentation. Abstracts should ONLY be sent by email to lynne@sfam.org.uk with the subject line "January 2004 Meeting submission.

The closing date for submissions is Friday 24th October 2003.

Trade Show

If you are interested in exhibiting at the Trade show at this meeting, please contact Lynne Boshier at the Society Office. Email: lynne@sfam.org.uk.

Costs, registration and Studentships

Costs are given on the Booking form overleaf. To book your place at the meeting please complete the Booking Form or visit the website where you can book and pay online. Students who wish to apply for a Society Studentship for this meeting can either complete the application form on page 24 or apply online at the Society website.

For the latest information please visit us online at:

www.sfam.org.uk

Programme

This programme was up to date at the time of publication but may be subject to change. For the very latest information and an online booking form please visit the Society website at www.sfam.org.uk

Wednesday 7 January

10.00 - 11.00 Registration - Coffee/Tea

11.00 - 11.40 Introduction: Surfaces and adhesion: a matter of life and death
Peter Gilbert, School of Pharmacy and Pharmaceutical Sciences, Manchester University, UK

11.40 - 12.20 Surface conditioning and microbial adhesion
Matteo Santin, School of Pharmacy and Biomolecular Sciences, University of Brighton, UK

12.20 - 13.00 Antimicrobials and indwelling catheters
Roger Bayston, School of Medical and Surgical Sciences, University of Nottingham, UK

13.00 - 13.40 Antimicrobial intravascular catheters - which surface to coat?
Mark Wilcox, School of Biochemistry and Molecular Biology, University of Leeds, UK

13.40 - 14.30 Lunch - Poster Viewing and Tradeshow

Ophthalmic and Dental/ Oral Devices

14.30 - 15.10 Biofilm related infections in ophthalmology
John Dart, Moorfields Eye Hospital, London, UK

15.10 - 15.50 Control of Bacterial adhesion to contact lenses
Gerda Bruinsma, Department of Biomedical Engineering, University of Gronigen, The Netherlands

15.50 - 16.30 *In vivo* bacterial adhesion to different contact lenses
Carol Morris, Diagnostic Lens Strategic Business Unit, Cibavision Corporation, USA

16.30 - 17.00 Tea/Coffee

17.00 - 17.40 Dental surfaces, diseases and treatment
Speaker to be confirmed

17.40 - 18.20 Photoactivated disinfection in caries and endodontics
Gavin Pearson, Queen Mary's School of Medicine and Dentistry, QMUL, London, UK

18.20 - 19.00 W.H. Pierce Memorial Prize Lecture

19.45 Tradeshow reception and Society Dinner

Thursday 8th January

New Technologies and 'SMART' surfaces

09.00 - 09.40 Microbial interactions with surfaces, studied on-line by a novel quartz crystal microbalance technique
Speaker to be confirmed

09.40 - 10.20 Atomic force microscopy and surfaces
Joanna Verran, Biological Sciences, Manchester Metropolitan University, UK

10.20 - 11.00 Biomimetic surfaces to reduce bacterial adhesion to medical devices
Andrew Lloyd, School of Pharmacy & Biomolecular Sciences, University of Brighton, UK

11.00 - 11.30 Tea/Coffee

11.30 - 12.00 Novel silicone-based materials with antimicrobial properties
Sean Gorman, School of Pharmacy, Queen's University Belfast, UK

12.00 - 12.40 New polymers
Speaker to be confirmed

12.40 - 13.20 Offered papers

13.20 - 14.00 Lunch - Poster Viewing and Tradeshow

Trigger systems: release of antimicrobials

14.00 - 14.40 Controlled release of antimicrobial from medical devices
David Stickler, Cardiff School of Biosciences, Cardiff University, UK

14.40 - 15.20 Controlling infection by tuning in and turning down the volume of bacterial small-talk
Paul Williams, Institute of Infection, Immunity & Inflammation, University of Nottingham, UK

15.30 Departure

Trade Show

If you are interested in exhibiting at the Trade show at this meeting, please contact Lynne Boshier at the Society Office. Email: lynne@sfam.org.uk.

BOOKING FORM and INVOICE

January Meeting 7 - 8 January 2004

'Microbial Interactions with Medical Devices: a mattter of life and death'

Only ONE person per form please. If additional forms are required please photocopy this one

SUGGESTION: please photocopy this form to save mutilating your copy of the Microbiologist!

CLOSING DATE FOR REGISTRATIONS

Wednesday 24 December 2003. A **LATE BOOKING FEE of £20.00** will be applied to all bookings made after **Monday 1 December 2003**

FEES

	Full Members	Student, Honorary & Retired Members	Non-Members
Whole Meeting Rate: includes registration fee, full breakfast, coffee and tea breaks, lunches, Society dinner and overnight accommodation for Wed 7th January.	£200.00	£100.00	£300.00
Day Delegate Rate: includes registration fee, lunch, tea and coffee breaks.	£65.00	£55.00	£150.00

Additional accommodation per night inclusive of breakfast: £120.00

YOUR COSTS

Charges - please tick the applicable box(es)	Amount
☐ **Whole Meeting Rate** (This includes accommodation, meals and the Society Dinner for the entire Conference):	£
☐ **Day Delegate Rate** (please tick the DAY you wish to attend): **Weds 7th:** ☐ **Thurs 8th:** ☐	£
☐ **Additional accommodation:** (please enter the extra NIGHT(S) you wish to stay:_____	£
☐ **LATE BOOKING FEE** Payable for all bookings made after Monday 1 December 2003:	£20.00
TOTAL AMOUNT REMITTED:	£

Please indicate any special dietary or other requirements (such as disabled access): _____

_____

YOUR DETAILS

Title:_____ **Family Name:**_____ **First Name:**_____

Address:_____

_____ **Postcode:**_____

Tel No:_____ **Fax No:**_____ **Email:**_____

YOUR PAYMENT

● **For all participants: The Society DOES NOT INVOICE for conference fees. Please treat your completed booking form as an invoice. Cheques must be in £ STERLING ONLY and made payable to 'The Society for Applied Microbiology'. Foreign cheques/ drafts MUST be negotiable for the full amount due. Please note that AMERICAN EXPRESS and DINERS CARDS are NOT ACCEPTED.** However the following credit and debit cards are acceptable: VISA, Mastercard, Eurocard, Delta, Electron, JCB, Maestro and Solo.

☐ **Cheque enclosed** ☐ **Please charge my *Mastercard/Visa card /Debit card*** *(please delete inapplicable items)*

TOTAL Amount enclosed/ to be debited: **(*Remember to include your LATE BOOKING FEE if your are booking after 1 December 2003)** £_____

Card number: ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ Expiry Date: ☐☐☐☐

Signature: _____ *Date:_____ Issue No. ☐☐☐ *(Debit cards only)*

Cardholder's address to which credit card statement is sent:_____

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Please return the completed form by fax (post if you are enclosing a cheque) to: **The Society for Applied Microbiology, The Blore Tower, The Harpur Centre, Bedford MK40 1TQ, UK. Tel: 01234 326661. Fax: 01234 326678. Email: meetings@sfam.org.uk**

STUDENTSHIP Application

Only ONE form per student please. If additional forms are required please photocopy this one

The Society meeting you wish to attend

Please tick the meeting you wish to attend: ☐ **sfam Summer Conference** ☐ **sfam January Meeting**

About this award

The Society offers Studentships to enable **student members** to attend Society meetings. These grants cover registration, accommodation, meals (where appropriate) and modest travel expenses. Preference is given to students offering a paper or poster and who have not previously received this award. To be considered for a Studentship grant, please complete this form in **BLOCK CAPITALS** and return it to the Society Office **no later than Friday 28 November 2003.**

Your details

Title:_____ **Family Name:**_____ **First Name:**_____

Address:_____

_____ **Postcode:**_____

Tel No:_____ **Fax No:**_____ **Email:**_____

University or College:_____

Your Department:_____ **Position in Department:**_____

Grant authority:_____

Your intended career:_____

Your costs

Expected Travel Costs:_____

Other costs - please specify:_____

_____

_____

Why do you wish to attend this meeting?

Please give your reasons:_____

_____

_____

Your signature:_____ **Date:**_____

(If you need more space for your answer please continue on a separate sheet)

Will you be contributing to the meeting by offering a Poster or presenting a paper? ☐ **Offering a Poster** ☐ **Presenting a Paper**

Your Supervisor's support

This section **MUST** be completed by your Supervisior or Tutor. Applications which are not supported by your Supervisor will be automatically rejected. **Please give your reasons why the applicant should receive a studentship:**

_____

_____

_____

Supervisor's name:_____ **Tel and extension:**_____

Supervisor's signature:_____ **Position:**_____ **Date:**_____

(If you need more space for your answer please continue on a separate sheet)

In signing this application I agree to reimburse the Society for any costs it may incur in awarding this grant should the applicant fail to attend the conference or fail to notify the Society of their inability to attend the conference within 14 days of the start of the meeting.

Please confirm your agreement by ticking the appropriate box: ☐ **I agree** ☐ **I do not agree**

Please return your completed application by fax or post to: **The Society for Applied Microbiology,**
The Blore Tower, The Harpur Centre, Bedford MK40 1TQ, UK. Tel: 01234 326661. Fax: 01234 326678. Email: meetings@sfam.org.uk

SUGGESTION: please photocopy this form to save mutilating your copy of the Microbiologist!

Joint Sfam/SGM One Day Regional Meeting

Transport of Microbes through soils and the environment

September 18, 2003, Lancaster University, UK

The invited papers will be for 30 minutes and offered papers for 15 minutes. Offered papers are open to anyone but we hope that most will be filled by PhD students and postdoctoral researchers. There is a poster sessions which will be viewed during lunch and coffee breaks.

A prize (jointly funded by SFAM and SGM) is available for the best oral presentation by a microbiologist in the early stages of their career.

Outline Programme

- **Introduction and overview**
  Keith Jones
- **Aspects of methodology**
  Prof. Roger Pickup
- **Offered papers**
- **Pathogen transport processes**
  Dr. Sean Tyrrel and Dr. John Quinton
- **Offered papers**
- **Lunch**
- **Transport of *E. coli* O157 through the environment**
  Prof. Ken Killam
- **Offered papers**
- **Summing up and discussion**
  Kirk Semple

Further information

Please contact the organisers: Keith Jones (k.jones@lancaster.ac.uk) or Kirk Semple (k.semple@lancaster.co.uk)

Costs

The cost to participants will be £15 which will cover lunch, coffee breaks and abstract information

5th European LIMS Forum

Waltham Abbey Marriot Hotel, London, UK

Conference: 28th & 29th October 2003

Workshops: 27th & 30th October 2003

The European LIMS Forum is a valuable meeting point between theory and practice in the implementation, integration and management of the automated laboratory. This year will concentrate on validation and regulation (21CFR part 11) as well as the commercial implications of developing technologies, particularly lab notebooks and Internet applications. The conference agenda is focused on the pharmaceutical industry, although in previous years our audience has included managers of QA/QC, analytical and R&D laboratories in petrochemicals, water, nuclear fuels and other industries.

Further information

http://www.eurolims.com or email: mfonda@masswick.com

Advertise your meeting on the Society website

The Society offers a free service to Microbiological organisations and Societies to advertise their meetings on our Meetings Diary page on the Society website at sfam.org.uk.

If you would like to use this service please contact Lynne Boshier at the Society Office on 01234 326661 or by email to: lynne@sfam.org.uk

PLEASE NOTE that acceptance of meetings advertisements is at the sole discretion of the Society. Preference will be given to advertisers who are either Society members and/or agree to reciprocal advertising of Society meetings on their website(s).

Design-a-bug

Pictures by Megan and Oliver Boulton

"Uncle Anthony," asked Sam, "what is it exactly that you do?"

"Well, I'm a microbiologist," I replied.

"What's one of those?" said Megan.

"A microbiologist studies tiny organisms which you often can't see without the aid of a microscope, the more famous ones you might have heard of like *Salmonella* can make people very ill, but not all of them are bad."

"What do they look like?" asked Oliver.

"Mmm…well, the bacteria I study are very small and look a bit like little beans under the microscope. They have little 'hairs' on them to allow them to stick to things and longer 'hairs' which help them swim around. The ones I study make people ill when they eat contaminated food."

"Have they got teeth and claws?" asked Megan.

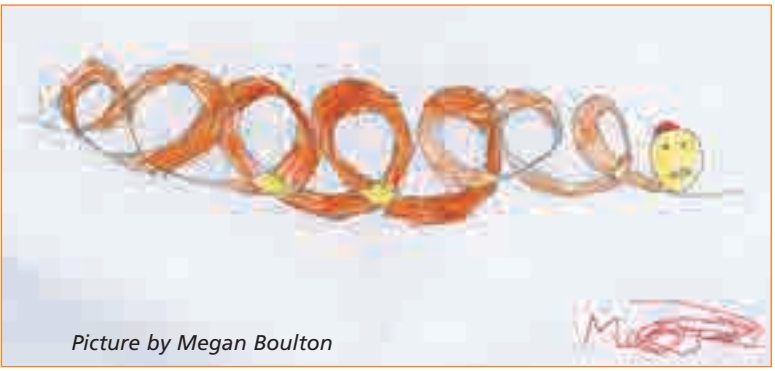
"What do you think?" I replied.

"I dunno," was the collective response.

"Well, I'll tell you what, why don't you draw me a picture of what you think bacteria look like."

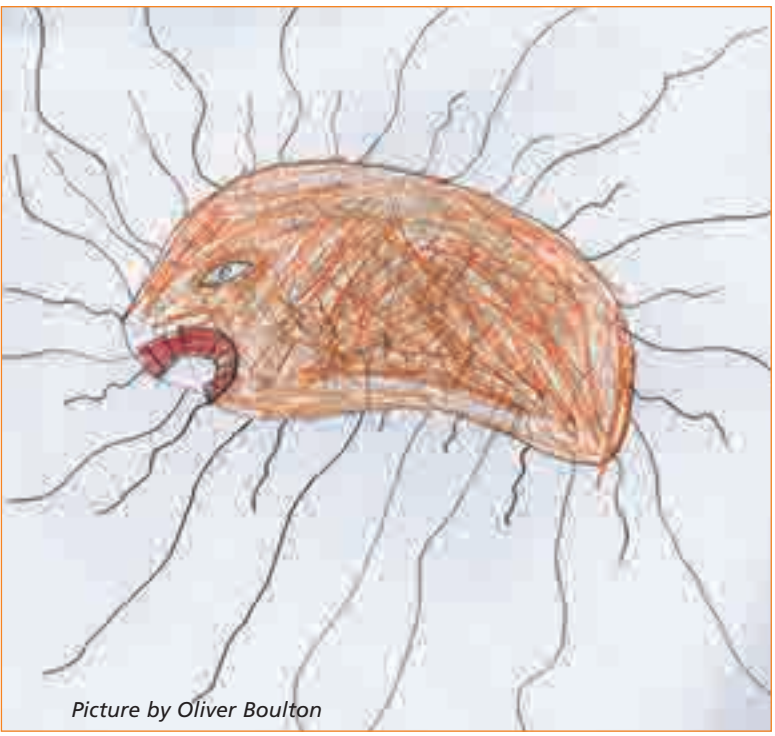
So they did...

A few months later while visiting a fellow microbiologist I saw that his office wall was covered with drawings of bacteria too. Do your children ever wonder what on earth you do? Have you ever tried explaining what bacteria / fungi / viruses are to young children? The Society is running a competition open to the children of microbiologists' family and friends with the chance to win a superb **Crayola**® drawing

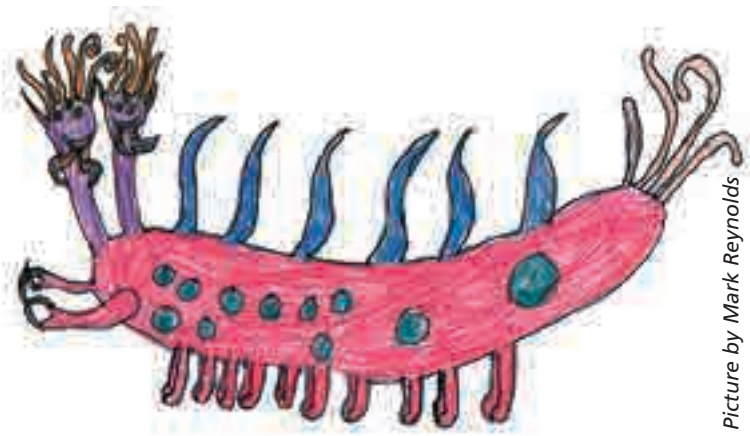


Picture by Megan Boulton

What do your children think bacteria look like? Do they ask you what on earth you do? If you have ever tried to explain what a virus is to a 6-year-old the Society's new competition may be just the thing to encourage the kids to learn about microbiology. **Anthony Hilton** explains how



Picture by Oliver Boulton



Picture by Mark Reynolds

set and have the winning pictures published in *Microbiologist*. The competition has three age categories: under 4 years, 5 to 8 years, and 9 to 12 years.

How to enter

Tell your children a story about microorganisms or describe what they might look like and let their imagination run wild. Then ask them to 'design-a-bug' and draw what they think they would see if they were to look down the microscope. Send their pictures along with their name, age, address and a brief description of what the picture is based upon to The Society Office. The closing date for entries is Friday 24th October 2003. Pictures will be judged in the three categories and the

winning entry decided by the Office staff. The winning entry in each category will receive a superb **Crayola®** drawing set and have their pictures published in the December issue of *Microbiologist*.

To make it even easier to enter we have included a simple form for you to photocopy and fill in.

Anthony Hilton
Aston University

Design-a-bug ENTRY FORM

Your details

Title: _____ **Name:** _____

Address: _____

_____ **Postcode:** _____

Details of Entrant

Child's Name: _____ **Age:** _____

Address: _____

_____ **Postcode:** _____

Category: under 4 yrs: ☐ **5 - 8 yrs:** ☐ **9 - 12 yrs:** ☐

Brief description of what the picture is based on:

_____

_____

_____

If you need more room for your description please continue on a separate sheet. Then photocopy this form and post it to the address below. If you are submitting entries for more than one child please complete a separate form for each one.

Please post the completed form together with your pictures to:
"Design-a-bug competition", The Society for Applied Microbiology, The Blore Tower, The Harpur Centre, Bedford MK40 1TQ, UK.

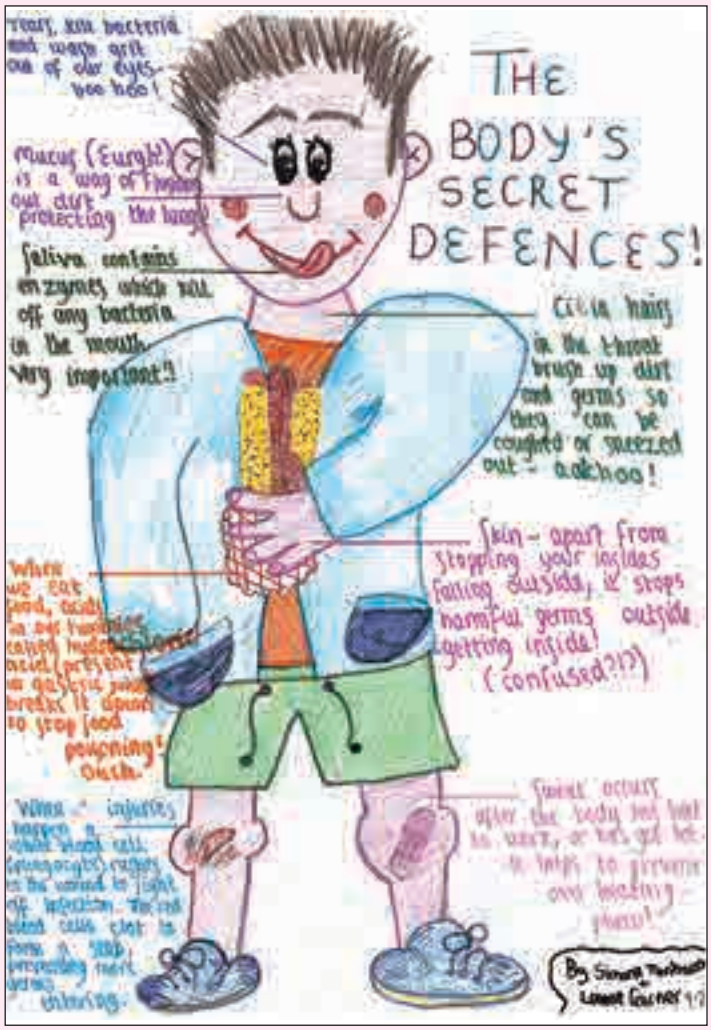
SfAM is sponsoring MISAC's 2004 Schools Competition entitled, ***"Composting not just a load of old rot but a way to save the planet".*** Turn to page 31 for more information

MISAC Schools Competition 2003

EACH YEAR the Microbiology in Schools Advisory Committee (MISAC) runs a competition for schools. The 2003 competition, sponsored by the Society for General Microbiology (SGM), was entitled *"Your Body is a Fortress: Non-Specific Defence Mechanisms Against Microbial Invaders"*. As the title makes clear, the mechanisms in question are those that provide general protection against invasion by microbes. They involve both physical barriers such as the skin and mucus, and chemical ones such as. gastric juices and secretions from glands.

To enter the competition, students had to produce

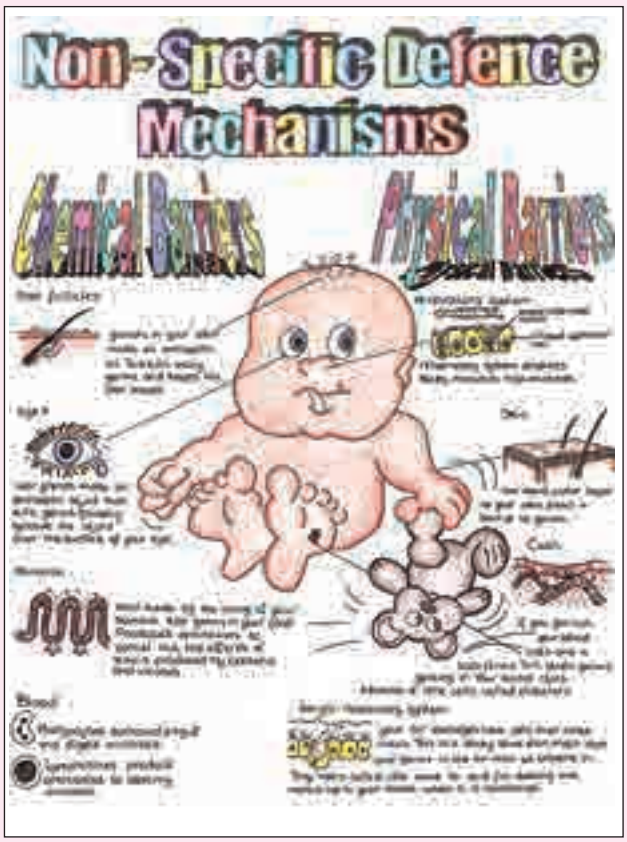
11-14 AGE GROUP First Prize: Megan Clare, St George's School



11-14 AGE GROUP Second Prize: Simone Tambaros and **Leanne Garner**, South Hunsley School

11-14 AGE GROUP Highly Commended: **Alicia Russell**, Kirkham Grammar School

GCSE AGE GROUP First Prize: **James Adair**, Newcastle Royal Grammar School



GCSE AGE GROUP Second Prize: **Siobhan Wilde**, Thornleigh Salesian College

GCSE AGE GROUP Third Prize: **David O'Sullivan**, Brinsworth Comprehensive

11-14 AGE GROUP Third Prize: Nicola Read, Kirsty Read and **Lauren Bibby**,
Howard of Effingham School

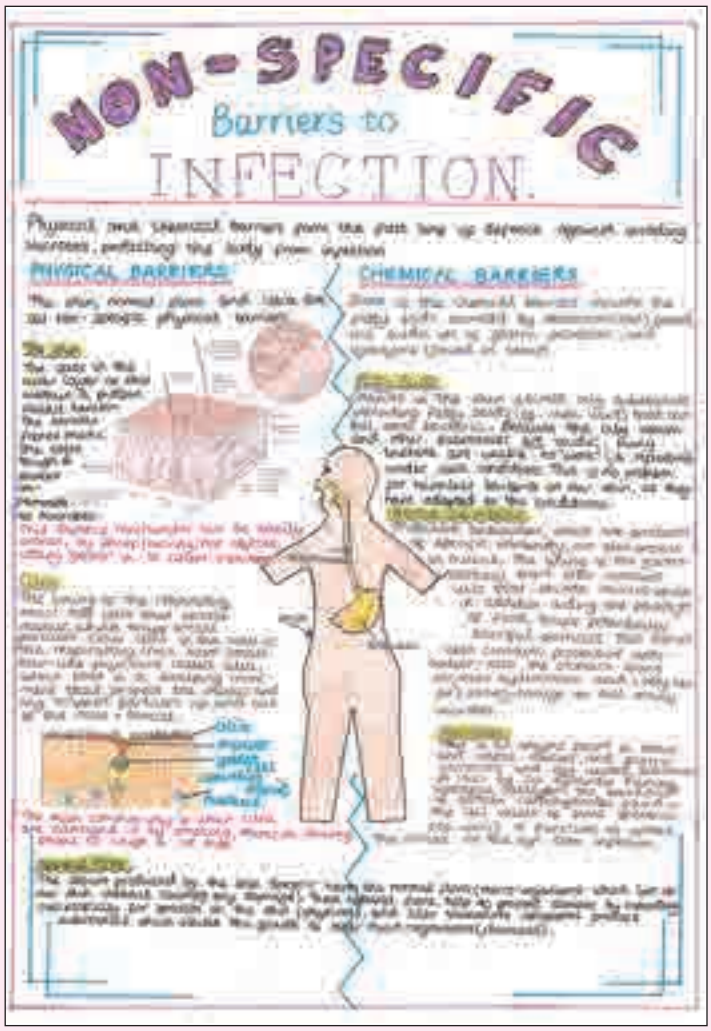
posters in each category are shown on these pages.

The Society is sponsoring the 2004 Competition. In this, entrants will be required to produce an illustrated information leaflet suitable for a local authority to distribute to the general public to encourage the use of composting as an important contribution to the recycling of waste materials.

Full details of this competition are shown opposite.

Martin Adams
SfAM representative to MISAC

GCSE AGE GROUP Highly Commended: Lauren Sparrow,
Diss High School



an eye-catching A3 annotated diagram of the human body highlighting non-specific barriers to infection by micro-organisms that could be used as a visual aid to support a talk given by the student to their peer group. In addition to the scientific content, the competition lent itself to the display of skills in ICT, drawing and writing by hand and in overall design.

There was an extremely good response to the competition, which attracted more than 1000 entries involving over 1600 students from 130 schools. Senior staff of the competition sponsor joined Officers and members of MISAC for the judging at the end of April. In assessing the entries, the judges looked for eye-catching diagrams of the human body that showed scientific accuracy, elements of originality and highlighted various non-specific barriers to infection. Diagrams that showed only parts of the body were eliminated at an early stage in the judging, as were those, however good in other ways, that referred to phagocytosis which, although non-specific, is effective only after invasion, or to immunity which is also effective only after invasion and involves specific modes of action. It was also important that the posters could serve as a visual aid to support a talk. One noticeable aspect of originality was evidence of the use of an entrant's own words rather than entire text being taken directly from sources such as the world wide web.

The high quality entries demonstrated a good grasp of relevant scientific points and an appreciation of effective ways of using a poster to communicate them. In addition to the three prizes in each age group (11-14 years and GCSE), the judging panel felt compelled to make two additional awards of Highly Commended. The winning

MISAC 2004 Schools Competition

"Composting not just a load of old rot but a way to save the planet"

sponsored by society for applied sfam microbiology

So what is compost?

Composting is a natural process where organic matter such as kitchen peelings, garden waste and grass clippings are converted into a brown crumbly material we call compost. During this process nutrients, water and carbon dioxide are released into the soil and air. A complex community of beneficial organisms ranging from creepy crawlies such as nematodes, woodlice and mites through to microbes is responsible for making the compost. Microscopic bacteria and fungi known as the decomposers are the initiators of compost production. There are as many as 1 billion microbes in every teaspoon of compost. How successful a compost heap is depends on a balance between the chemical and physical composition of the waste material, the range of organisms naturally present and the conditions of temperature, aeration and moisture.

The Competition

SfAM is sponsoring MISAC's 2004 Schools Competition entitled, ***"Composting not just a load of old rot but a way to save the planet".*** In this, entrants will be required to produce an illustrated information leaflet suitable for a local authority to distribute to the general public to encourage the use of composting as an important contribution to the recycling of waste materials.

The leaflet should include the principles of the composting process paying particular attention to the role of microbes, how to make compost and the uses and benefits of compost. The leaflet must comprise two sides of an A4 sheet of paper (210mm x 297mm) folder down to A5 (148mm x 210mm) to make a four page A5 sized leaflet. It is important that you use your own words and design your own layout.

Relevant points might include:

- Materials that are suitable for composting
- Roles of the various types of microbes involved
- Technology of the process
- Ways of improving the process
- Uses and value of compost
- Community composting
- Large scale commercial composting
- Government targets and EU directives for recycling of waste
- Other sources of relevant information

Closing Date

The closing date for entries is Wednesday 31 March 2004

Entry form

Full details of the competition and a PDF entry form can be found on MISACS's website at:**www.microbiologyonline.org.uk/forms/misac04.pdf**

Richard Armstrong untangles the prions responsible for transmissible spongiform encephalopathies

Getting your proteins in a twist: disease caused by prions

IN RECENT YEARS, a number of diseases caused by proteinaceous infectious agents called prions have been described (Prusiner 1995) and collectively referred to as the 'transmissible spongiform encephalopathies' (TSE). Prions, which are composed mainly of protein, differ significantly in behaviour from either bacteria or viruses. Prion diseases include 'scrapie' in sheep, 'bovine spongiform encephalopathy' (BSE) in cattle, and Creutzfeldt-Jakob disease (CJD) in humans.

These diseases are important because they can be transmitted between members of the same species and can also cross the species barrier and adapt to new hosts. Of particular concern, is whether a new form of CJD in humans termed variant CJD (vCJD) can be acquired by eating beef contaminated with prions. This article describes the nature of prions, how prions may cause disease, and the symptoms and pathology associated with the TSE.

Prion protein

Prions lack either DNA or RNA and are composed almost entirely of different forms of protein called prion protein (PrP). PrP is a protein that is made normally in the brain and is coded by a gene, which

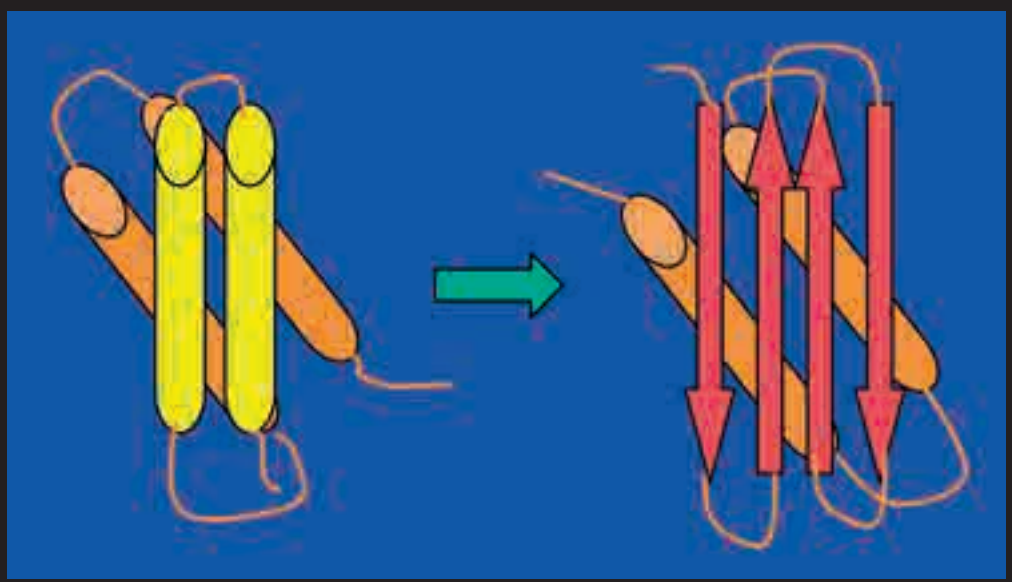


Fig 1. Conversion of normal prion protein (PrPc) to the scrapie form of PrP (PrPsc) in the presence of PrPsc. PrPc is believed to comprise four α-helices with virtually no β–sheets. PrPSc displays an identical primary structure to PrPc but differs in secondary and tertiary structure. PrPsc displays a four-stranded β-sheet configuration (vertical arrows) covered on one face by two α-helices.

in humans, is located on chromosome 20. The natural function of PrP is unknown but it is found in synaptic nerve endings suggesting that it may function in neural transmission. There are two forms of PrP, viz., normal cellular PrP (PrPc), which does not cause disease and the 'scrapie' form of PrP (PrPsc), the presence of which can induce the disease 'scrapie' (DeArmond and Prusiner 1994) (Fig 1). These two forms of PrP are identical in amino acid composition but they differ in conformation or shape of the molecule. The two forms also differ in glycoform, i.e., in the composition of attached chains of carbohydrates. Hence, the pathogenic form of PrP (PrPsc) is a stereoisomer of PrPc the tertiary structure of which is made up of b-pleated sheets resistant to proteases. The key to understanding prion disease is the fact that 'benign' PrPc can be converted into 'malignant' PrPsc in the presence of PrPsc (Fig 1). Prusiner (1993) found that transgenic mice reared without PrPc could not be infected with scrapie suggesting that PrPc was required for the disease process to take place. This process is auto-catalytic and once started proceeds at an exponential rate within the brain. PrPsc, due to the presence of b sheets, has a greater tendency than PrPc to form insoluble aggregates in brain tissue. Hence, the deposition of PrPsc in association with neurons presumably causes their death leading to the appearance of vacuoles in the tissue (Armstrong et al., 2002). Within the brain, PrPsc appears to target specific nerve cell populations and may spread through the brain via cerebral spinal fluid or by anatomical connections (Prusiner and DeArmond 1994; Armstrong et al., 2000). The appearance of PrPsc causes little or no immune response in the patient since the host immune system is presumably tolerant of the host protein.

Each species has its own PrP with a specific amino acid composition. In theory, it is difficult to transmit prion diseases across the species barrier, e.g., to transmit 'scrapie' from sheep to rodents or BSE from cows to humans. However, the more closely the amino acid sequence of an infective PrPsc is to that of the host PrPc, the greater the chance of initiating the conversion of PrPc to PrPsc. Sheep and cow PrP are very similar, supporting the contention that the agent may have crossed this species barrier. By contrast, there is much less similarity between cow and human PrP presumably making it more difficult for this species barrier to be crossed.

Prion diseases (TSE)

The fact that prions could cause a transmissible disease was first demonstrated when the 'scrapie' agent derived from sheep was injected into the brains of healthy mice. Mice acquired 'scrapie' like symptoms and the brain pathology associated with this disease.

This occurred even when the agent was exposed to UV light that would destroy any nucleic acid present. Several TSE's are known and continue to be identified especially in animals (Table 1).

Animal TSE

The best known of the animal TSEs is the 'trembling disease of sheep' called 'scrapie' first described in 1772 (Scott, 1993). Animals with this disease lose coordination and balance but the name 'scrapie' is taken from the tendency of the animals to scrape off their wool. The brains of affected animals exhibit the typical signs of prion disease including the development of vacuolation, neuron loss, and astrocytosis (a proliferation of astrocytic glial cells). BSE is a relatively new form of prion disease first described in cattle in 1986. By 1989, 50,000 cattle in the UK were infected. Affected cows become apprehensive and uncoordinated and develop similar brain pathology to that seen in 'scrapie'. Two theories have been proposed to account for the BSE epidemic. First, that TSE infected animal feed supplement containing the scrapie agent was given to cattle. Second, that the disease has its origin in the very uncommon hereditary form of the disease and that the remains of these animals may have entered the processing of animal feed. Prion diseases have also been described in cats, deer, elk and mink.

Human TSE

Creutzfeldt-Jakob disease is one of a group of human diseases caused by prions (Table 1). In addition to CJD, three other human prion diseases have been identified. Firstly, 'kuru' is a disease found in the 'Fore

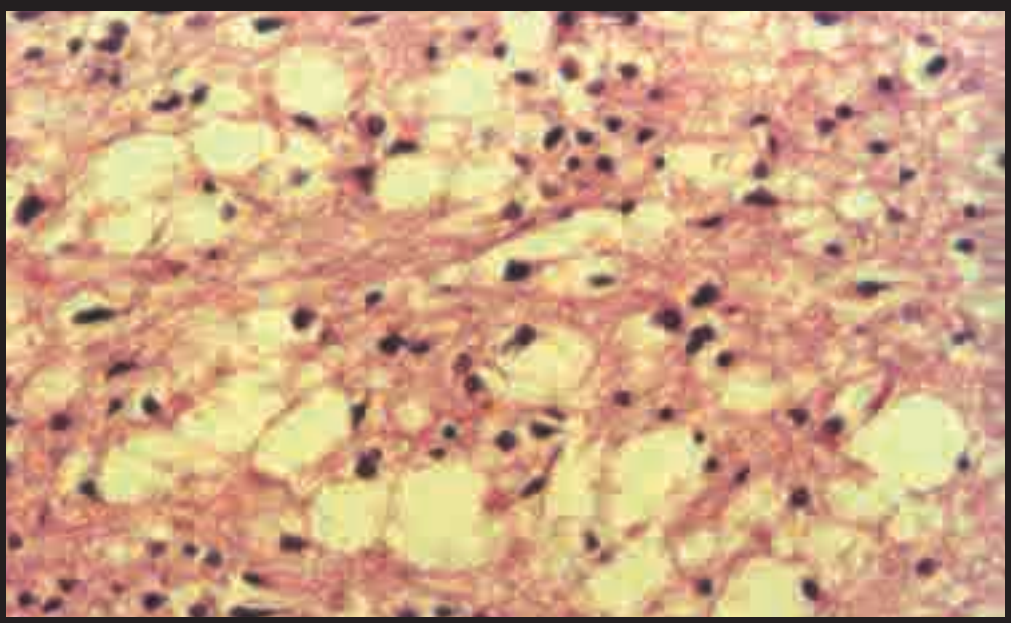


Fig 2. Vacuolation ('spongiform change') in the cerebral cortex of a patient with sporadic Creutzfeldt-Jakob disease (sCJD). Section stained with H/E. Vacuoles appear as distinct holes in the section while the dark structures are neuronal cell bodies or glial cell nuclei.

highlanders', natives of Papua and New Guinea, and probably acquired as a result of ritual cannibalism. Secondly, 'fatal familial insomnia' (FFI) is a recently described genetic disorder that is characterised by sleep disturbance followed by insomnia and agitation and later, by the development of hallucinations, stupor, and coma. Thirdly, 'Gerstman-Straussler-Scheinker' (GSS) disease is a rare genetic disorder first described in 1936. It is characterised by ataxia (muscular incoordination), dementia (loss of short-term memory, judgement, and emotional disturbance), limb weakness, and speech problems. It can sometimes resemble types of multiple sclerosis and therefore, can be difficult to diagnose in individual patients.

CJD was first described by Creutzfeldt and Jakob in the 1920s and is the most important human form of prion disease. Patients develop dementia, which is sometimes preceded by ataxia, and loss of coordination, with death resulting in about 3-12 months after the onset of symptoms. The characteristic pathological signs of prion disease are observed in the brain including vacuolation (Fig 2), neuronal loss, the proliferation of astrocytes and the deposition of PrPsc in the form of discreet 'plaques' (Fig 3). CJD exists in several forms including those associated with genetic factors (familial or fCJD), those resulting from transmission of PrPsc (iatrogenic or iCJD) and those that occur sporadically within the population (sCJD). About 10-15% of cases of CJD are genetic and this condition is inherited as an autosomal dominant gene. These cases appear to be caused by point mutations (a change in one codon of the DNA resulting in the substitution of one amino acid for another) of the PrP gene. A small number of cases can be traced to a transmissible cause (see Table 2). Possible sources of transmission include corneal transplant, the use of electrodes implanted in the brain, neurosurgery, dura matter grafts, and the use of growth hormone. The latter was acquired as a result of the use of growth hormone extracted from human pituitary glands. This cause of CJD has now been largely eliminated as a result of the use of genetically engineered growth hormone. About 85% of recorded cases of CJD are sporadic. The mean age of onset of sCJD is 60 years of age and its incidence is approximately 1/1,000,000. Two theories have been proposed to explain cases of sporadic CJD. Firstly, a mutation of the PrP gene could result in the formation of PrPsc rather that PrPc or secondly, PrPc could be converted spontaneously to PrPsc. The chance of both processes occurring could increase with age.

The possible development of CJD as a result of eating infected beef is of great current concern. The risk of transmission of BSE to humans is believed to be low because of the differences in structure between the 'scrapie' agent and human PrP. However, the recent

Table 1.
Human and animal transmissable spongiform encephalopathies (TSE)

Disease	Abbreviation	Host
Creutzfeld-Jacob disease	CJD	Human
Kuru	-	Human
Fatal familial insomnia	FFI	Human
Gerstmann-Straussler Scheinker disease	GSS	Human
Scrapie	-	Sheep/mouse
Bovine spongiform encephalopathy	BSE	Cattle
Feline spongiform encephalopathy	-	Cat
Chronic wasting disease	-	Deer/elk
Transmissable mink encephalopathy	-	Mink

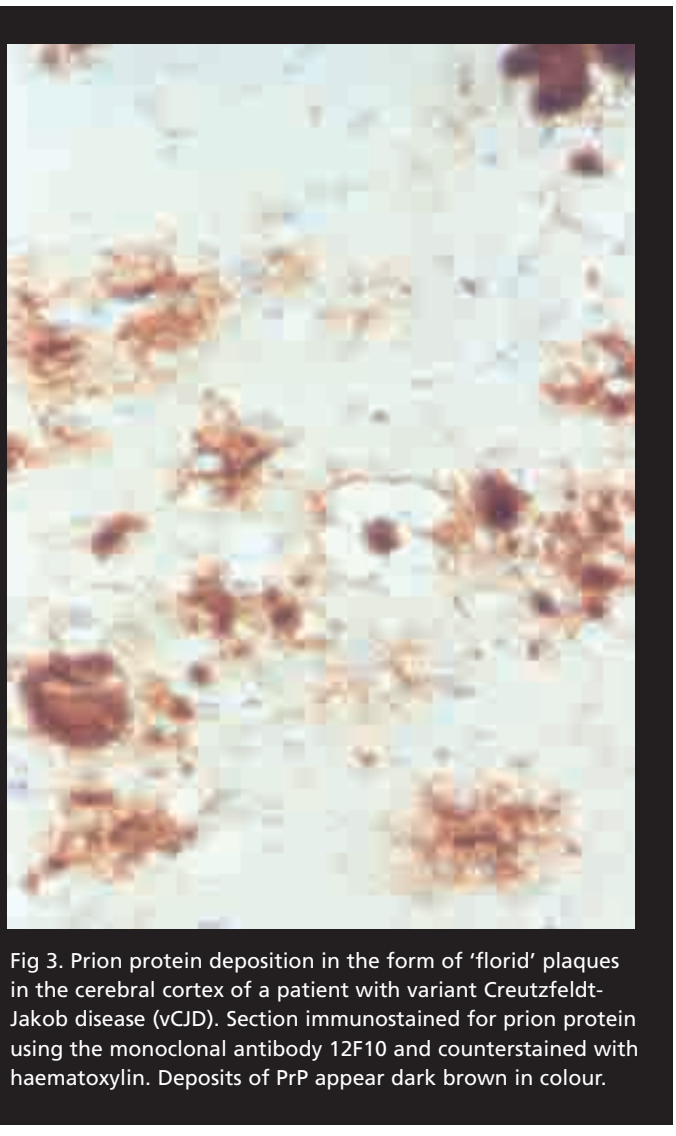


Fig 3. Prion protein deposition in the form of 'florid' plaques in the cerebral cortex of a patient with variant Creutzfeldt-Jakob disease (vCJD). Section immunostained for prion protein using the monoclonal antibody 12F10 and counterstained with haematoxylin. Deposits of PrP appear dark brown in colour.

Table 2. Methods of transmission of Creutzfeld-Jacob disease

Mode of transmission	'Incubation period'
Corneal transplant	>2 years
Depth electrodes	>2years
Neurosurgery	>2years
Dura matter grafts	>2years
Growth hormone extracts	4 - 30 years, average 12 yrs
Eating infected beef	?

appearance of vCJD, which may be related to BSE, is causing considerable concern. The BSE agent is virtually identical to that causing vCJD supporting the hypothesis of a direct link. The first cases of vCJD were recorded in 1995 and by 2003, the total number of deaths ascribed to this disease was 125. This new variant differs significantly from previously described forms of CJD being characterised by an earlier age of onset (mean 28 years) and a prolonged duration of illness (up to 2 years). Presentation of the disease is largely psychiatric with patients exhibiting anxiety, depression, and behavioural changes. After a period of weeks or months, a cerebellar syndrome develops with problems in walking and movement. Memory problems develop late in the clinical course and the patient ultimately becomes mute and unable to move. Myoclonus (limb jerking) occurs usually at some stage in the disease in the majority of patients. In addition, the pathology of vCJD differs significantly from other forms of CJD with widespread concentrated deposits of PrPSc throughout the brain referred to as 'florid plaques' (Armstrong *et al.*, 2002b) (Fig 2). Whether these cases represent a small cluster of cases linked to BSE or the beginning of a larger BSE epidemic of vCJD is controversial and remains to be established.

Conclusions

Although TSE have been known for many years, the knowledge that these diseases are caused by prions is relatively recent and extends the classification of human infectious disorders. Prions exhibit little of the behaviour characteristic of viruses or bacteria and the principles of infectious disease derived from these entities may be of little help in understanding prion disease. This lack of basic knowledge was a major problem in the 1980s and 90s when the BSE epidemic was at its height and government policy was formulated often in a climate of scientific ignorance.

A major concern with reference to the TSE is that disease can be transmitted both within and between species and therefore, can be passed to humans. Despite the occurrence of some 'clustering' of cases of CJD, it seems very unlikely that the disease can be transmitted by close human contact. There is no evidence, for example, of increased incidence of CJD in neurosurgeons or pathologists who are likely to have increased exposure to PrP. In some rare instances, CJD does appear to have been transmitted to humans via corneal grafts (Hogan and Cavanagh, 1995). In experiments using the 'scrapie' agent, mice infected through the retina exhibited neuronal losses in the lateral geniculate body coincident with the onset of vacuolation. This suggests that the disease could spread into the brain via the visual pathway. However, the risk of CJD transmission by this method would seem to be remote. It has been calculated that between 0.5-4 CJD infected organ donors would be expected in a single year in the USA. The current 'Eye Bank Association of America' criteria for exclusion of donor corneas based on suspicious history are usually considered adequate to protect against accidental transmission.

There remains considerable anxiety in the UK about the likely development of new cases of vCJD that have been incubating since the 1980s although the most recent data do suggest a decrease in the rate of increase of new cases. It has been known for some time, however, that the phenotypic features of CJD are influenced by a polymorphism of the PrP gene at codon 129, *viz.*, the presence of either methionine or valine at this codon. In the TSE kuru, methionine homozygosity at codon 129 results in cases with earlier onset and shorter duration, a similar phenotype to vCJD. All vCJD cases described to date have been methionine homozygotes. Hence, there could be larger numbers of future vCJD cases, heterozygous at codon 129, and which have much longer incubation periods.

Richard Armstrong
Vision Sciences
Aston University, UK

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Once again, our members have used a **President's Fund** grant to attend a variety of meetings and conferences around the globe. To find out how ***you*** could benefit from this valuable award check out the panel below or visit our website.

Am I eligible - can I apply?

The **President's Fund** provides limited grants to **ALL members** to assist them to attend scientific meetings or workshops related to their area of work. Awards are made at the sole discretion of the Honorary President.

Please note that this Fund is open to members of all ages! It is not only our student members who require our help. Senior microbiologists often find difficulty in funding attendance at meetings, and the President's Fund is there to help them. **If YOU are in this position, why not apply to the President's Fund?**

Guidelines

1 The applicant must have been a member for at least a full subscription year before the event to be attended and must be a fully paid-up member at the time of application.

2 A successful applicant cannot re-apply to the Fund for three years from the date of the award.

3 Preference will be given to applicants who are contributing to the meeting they wish to attend and/or are unable to obtain funds elsewhere.

4 Application forms, together with an abstract of any intended contribution to be made, must be received by the Society Office not less than six weeks before the date of the event.

5 Student member applicants must enclose a letter of support from their supervisor or head of department on the letterhead of their institution.

6 The maximum grant available is normally £500.

7 Under exceptional circumstances this maximum may be exceeded.

Applications for a grant from this Fund can be made via the Society website or using the official form available from the Society Office.

The 8th International Congress of Plant Pathology: solving problems in the real world

Christchurch, New Zealand 2nd-7th February 2003.

The congress was held in the Christchurch Town Hall/Conference Centre Complex on New Zealand's South Island. The conference aimed to look at current problems associated with plant diseases and their impact on primary food production, considering in particular the biosecurity implications of movement of plant crops and products between countries. The conference was a valuable opportunity to meet with plant pathologists from Pacific rim countries and discuss particular problems associated with farming crop plants in tropical regions.

The congress opened with a series of introductions from the ISPP Chairperson, members of the conference Organising Committee and the honourable **Pete Hodgson**, the New Zealand Minister for Research, Science and Technology. In addition, there was a more energetic traditional 'welcome' from an intimidating group of Maori dancers. The Presidential Address was given by **Professor L Burgess** of Sydney University who discussed the vital role of plant pathologists in promoting biosecurity during worldwide trade in agricultural products. He discussed the importance of the World Trade Organisation agreement on the application of sanitary and phytosanitary measures to ensure that global trade does not become a biosecurity concern or a hazard to ecosystem balance. The vital role of the Plant Pathology community in surveillance, diagnostics, monitoring, eradication programmes and education in restricting disease spread in plants was emphasised.

The subsequent conference sessions covered a wide range of areas including: phytopathology of the Asia/Pacific region, the taxonomy and physiology of plant pathogens, disease management strategies, host-pathogen interactions and plant resistance and breeding. An interesting session on vascular pathogens looked at various aspects of such diseases caused by bacteria and fungi. A presentation by **Professor Tim Denny** profiled the colonisation of tomato by *Ralstonia solanacearum*, and discussed the role of different virulence determinants in promoting colonisation and tissue invasion. Another presentation by **Dr S De Boer** discussed the soft rot *Erwinia*s and described how transgenic plants, able to produce bacterial quorum sensing molecules, disrupt virulence processes and show resistance to soft rot infection. Of particular interest were sessions on how plants recognise pathogens, which discussed the complex signalling mechanisms that activate resistance processes and allow the host to protect itself from attack.

The conference also allowed us to experience some of the attractions of New Zealand and the Christchurch region, including wine tasting, the spectacular Botanic Gardens and sunshine in February. The conference gave me a valuable opportunity to meet researchers from New Zealand, particularly those working on *Erwinia amylovora*, which represents a considerably greater plant health problem there than in the UK.

I would like to express my gratitude to the Society for Applied Microbiology for awarding me a President's Fund grant and helping me to attend this important meeting.

Julie Eastgate
The University of Paisley, UK

European Helicobacter Study Group XV International Workshop on Gastroenterology Pathology and *Helicobacter*

Athens, Greece 11th - 14th September 2002

The annual workshop organized by the European *Helicobacter pylori* Study Group (EHPSG) provides an innovative and comprehensive overview combining the latest research developments for *H. pylori* and *Helicobacter* spp. in the pathogenesis of diseases of the gastrointestinal tract, and clinical developments for diagnosis and treatment. On the 20th Anniversary of its first isolation **Barry Marshall**, who first isolated the bacterium in 1982, gave an anniversary lecture.

The transmission route of *H. pylori* has not been elucidated and although infection is commonly associated with humans, *H. pylori* has been shown to infect animals including sheep, cats dogs and monkeys naturally. Cittelly *et al.* found that monkeys studied in India were infected with strains of identical genotype as humans from the same sample region. A similar phenomenon was observed among sheep and the local human population in Sardinia, therefore *H. pylori* is probably transferred from humans to the local animal population. Kearney *et al.* found no significant association between *H. pylori* infection and drinking water source, or cat and dog ownership among children and adults in the USA. Risk factors associated with a *H. pylori* infection were also presented. Passaro *et al.* identified a predominant role of sibling-to-sibling transmission in shaping *H. pylori* epidemiology in a Peruvian shanty town.

The mechanism of resistance to metronidazole has yet to be fully elucidated. Current work is concentrating on the oxidoreductase proteins *Rdx*A and *Frx*A, and their genes. Alarcón *et al.* found a high correlation between the production of *Rdx*A protein detected by immunoblot and the susceptibility of the *H. pylori* strains studied. Pietroiusti *et al.* investigated the mutations occurring in the rdxA gene. They identified nonsense mutations in the gene of 5 strains however only one, which resulted in a stop codon in the protein, was shown to be related to resistance. Mendz *et al.* showed the involvement of the *Frx*A protein in the reduction of nitro compounds with low redox potential in *H. pylori* and in *E. coli* strains transformed with the *Frx*A. RAPD profiles and 2D-PAGE was used by Lui *et al.* to show that metronidazole resistance was the result of a defective protein.

The mechanism of clarithromycin resistance has been identified as a single point mutation occurring at position 2142 or 2143 in 23S rRNA gene. Three mutations are known: A2142G, A2143G or A2142C. Pietroiusti *et al.* detected the presence of a novel mutation T2717C that was present in seven strains that did not express any of the common mutations. Alarcón *et al.* described a novel real-time PCR assay for the LightCycler based on the wildtype sequence that allows the distinction of sensitive and resistant isolates. Existing PCR-RFLP assays were used to analyse Iranian strains by Doroud *et al.* Fluorescent *in situ* hybridization was also investigated as a method of distinguishing resistant strains from biopsies by Zanetti *et al.* allowing the distinction between sensitive and resistant isolates.

Elviss *et al.* compared three molecular techniques that allowed the three mutations and wild type strains to be identified: 3'-mismatched reverse primer PCR (3M-PCR), PCR-RFLP and the LightCycler. The 3M-PCR and the LightCycler showed the best concordancy and the 3M-PCR was more accurate at detecting low copy numbers of the resistant genotype in mixed or heterozygote strains.

John Atherton presented the lecture in memory of John Calam on *H. pylori* virulence and gastroduodenal disease. It discussed associations between non-conserved virulence factors including cagA, vacA, babA2, iceA and oipA and the associations of the proteins encoded by these genes and disease.

Abstracts from the meeting are published in Gut 2002, **51** (suppl. II) and a summary of the Workshop can also be found at: www.helicobacter.org. The XVI International workshop on Gastroenterology Pathology and Helicobacter is to be held in Stockholm, Sweden on 3 - 6 September 2003.

I am beginning the final stage of my PhD and the meeting provided an excellent overview of current research and clinical practice for *H. pylori* that is particularly useful for my thesis. The clinical data presented showed the most recent treatment practices and provided an insight into the problems clinicians experience due to antibiotic resistance in children and adults. The workshops highlighted the difference between children and adults in the testing for infection and in treatment regimens chosen. These data are excellent background material for my surveillance work and has allowed me to understand the treatment choices clinicians make. Research into the levels of antibiotics resistance and the mechanisms of resistance have provided up-to-date data for different centres throughout Europe and have provided potential new methods that can be used to provide further information for my thesis.

My two abstracts to the conference were accepted as oral presentations, giving me the opportunity to experience questions from peers in my chosen field of study and to improve my presentation skills.

I would like to take this opportunity to thank the Society for Applied Microbiology for their contribution to my travel, which allowed me to attend this meeting.

Nicola Elviss
University of Bristol, UK

The 10th International Symposium on Staphylococci and Staphylococcal Infections (ISSSI) conference

Tsukuba, Japan
October 16th - 19th, 2002

This was the first time that the conference had been held outside Europe, and it was hoped to encourage a worldwide audience to this very stimulating three-day event focusing on the genus *Staphylococcus*. It certainly achieved its aims with many more Asian clinicians attending from outside Europe and an overall audience of over 370 delegates.

Approximately 475 submitted abstracts testifies to the massive amount of research into this area! The subject area was wide ranging and many posters delivered very up to date research across a broad subject area, including animal studies, new and existing antimicrobial compounds, associated diseases, novel methods of detection, identification of new virulence factors, genomics and post-genome-sequence research and, of course, that growing threat; vancomycin intermediate *Staphylococcus aureus*.

The conference was hosted by The Japanese Symposium on Staphylococci and Staphylococcal Infections chaired by Professor **Keiichi Hiramatsu**. Most people will associate his name with the first report of emerging resistance to vancomycin in methicillin resistance *S. aureus*.

The organisation of the conference was very slick with everything being carried out over the world wide web. The conference facilities, accommodation, transport and conference programme were all first class.

The conference began with a reception followed by **Professor Hiramatsu's** opening address. The following morning was devoted to the *Staphylococcus* genome and gene regulation. This session was opened by a very detailed talk on the functional organisation of the genome by **Professor Hiramatsui** and followed by two talks on comparative gene sequences of methicillin resistant *S. aureus*, methicillin sensitive *S. aureus* and *S. epidermidis*. The session continued with **Professor Arvidson** from Sweden and **Professor Cheung** from the USA talking about the role of different regulons on gene expression and went on to describe new techniques that are helping them unravel the complexities of regulatory genes. After lunch, the emphasis changed to antimicrobial resistance using antibiotic and antiseptic/disinfectants as examples. Regulatory factors, resistance mechanisms and epidemiology were all described but the biggest take home message from this session was given by Linda Weigel from the centres for Disease control and Prevention, USA who described the emergence of a case of vancomycin resistant MRSA from a patient in Michigan. This patient has a leg ulcer and was colonised by MRSA and a vancomycin resistant enterococcus. The *vanA* gene had been demonstrated in the new isolate of VRSA. A second case had been notified to the Centre but there was little detail available prior to the conference. The researchers were very keen to get hold of the strain but as yet it had not been released to the research community. The latter part of the day focussed on nasal carriage and community acquired *S. aureus*. A range of epidemiological techniques and data were described alongside some interesting analytical methods. That evening a local traditional Japanese four-piece band, beautifully dressed in their kimonos, entertained us.

The second day began at 8.00am with a long session on pathogenesis. A variety of speakers described the use of molecular methods now employed to unravel some searching questions such as colonisation and the role of various surface proteins, in particular fibronectin-binding protein. The role of a range of toxins and subsequent development of disease was well described and of particular interest to me was a talk by *Patrick Schlievert* who described the role of superantigens in *S. aureus* infections. Therapy, Immunity and prevention came after lunch and in this session we learned a great deal about the host response to infection. The concept of antibiotic peptides (or regulatory effector molecules) as treatment of disease and the use of monoclonal antibodies to reduce the outcome of infection was described.

This was followed by a session on drug discovery where speakers from the USA gave details of the state-of-the art drug discovery regimes and the use of novel targets. They went on to highlight how knowledge gained from the genome sequence was allowing the development of novel drugs and approaches for future treatment. An adjacent session on animal infection focussed on the comparative genomics of bovine mastitis strains of *S. aureus* and their role in disease. A most impressive banquet was held shortly after the close of the academic session. This truly was a feast to remember with traditional Japanese cuisine at its best. There was also plenty of Saki for those who could drink it! We were served by Japanese in traditional dress...most impressive!

The final session began the following morning at 8.00am and finished at lunchtime. This session focussed on various typing methods used to establish the true epidemiology of *S. aureus*. New and established techniques, such as multi-locus sequence typing (MLST) and pulse field gel electrophoresis (PFGE), were described and the outcome on understanding the evolution of certain clones of *S. aureus* discussed. Other high-throughput methods used in a clinical laboratory were described. The morning session broke for coffee with a talk from **Mark Struelens**, from Belgium who described a variety of methods used for typing. The next session looked at infection control from a worldwide perspective. Various techniques used in different countries and the impact on nosocomial infection was discussed and we were left with the question on how we would contend with these problems in the future.

The conference programme was brilliant and I enjoyed every minute of it! I also managed to see a little bit of Japan. Tsukuba was very near to Tokyo and I managed to see a little of this impressive city.

Finally, I would like to thank the Society for assisting me to attend this conference.

Valerie Edwards-Jones
Biological Sciences,
Manchester Metropolitan University

International Symposium on Microbial Control Methods in the European Pharmacopoeia: Present and Future.

Copenhagen, Denmark, 5th - 6th May 2003

The subjects presented were more interesting with a direct application to my daily activities. The Symposium was organised by the *European Directorate for the Quality of Medicines* with the purpose of providing a forum for exchanges between industry, manufacturers of raw materials and culture media, control laboratories, pharmacopoeias and licensing laboratories. This was a very successful meeting with 146 delegates from 26 countries attending.

The Symposium was divided into six sessions and new techniques based upon more rapid methods for the microbiological analyses of sterile and non sterile medicines were discussed. These methods may be applied for the detection and enumeration of bacteria, mycoplasmas and fungi. The necessity of their incorporation into the pharmacopoeias was evaluated.


Langelinie Pavilloenen, Copenhagen, Denmark

The European Pharmacopoeia will now consider how rapid methods can be incorporated into the official general chapters that are the basis for monograph test methods. The potential candidate technologies described were: ATP bioluminescence, solid phase laser cytometry, fluorescence flow cytometry, impedance, DEFT, colorimetric CO2 detection, automated identification systems, nucleic acid probes, PCR, 16 s RNA sequencing, automated riboprinting, fatty and profiling, MALDI-TOF and ELISA.

The development of innovative media for the enumeration and detection of specified micro-organisms which save time and labour and alternative methods for microbiological water testing were also discussed and explained. Consideration was also given to cytometry in solid phase, bioluminescence in liquid phase and bioluminiscence in solid phase for qualification purposes and for routine monitoring of water systems.

I am very grateful to the Society for providing me with a grant from the President' s Fund to enable me to attend this international Symposium. It allowed me to network with other professionals and will ultimately lead to improvements in our daily work.

María Cristina Fernández
Instituto Nacional de Medicamentos (INAME)
Buenos Aires, Argentina

Three Society members received a **President's Fund** grant to attend the 2003 ASM Annual General Meeting. Their reports follow below:

103rd ASM annual General Meeting

Washington DC, USA
18th - 22nd May 2003

I would like to begin by thanking the Society for Applied Microbiology for supporting my trip to Washington DC. AGM's are large events, and attract microbiologists of every discipline form all over the world. The conference was held in the newly built Washington DC convention centre and comprised three main sections; seminars, posters, and a trade fair.

The poster sessions were massive and always attracted a large crowd which provided great opportunities to meet researchers from related fields of study, exchange ideas and information, and hopefully make new contacts.

Visiting the posters of other researches in my field gave me a chance to talk to people using the same methods, and discuss common problems. This was especially useful for finding out about new techniques, solving problems with existing methods, and generating new ideas. The poster sessions were also great for broadening overall knowledge, and gaining insights into areas of microbiology other than your own.

Presenting my own poster gave me the chance to get lots of feedback on my own work, and helped me gauge how my ideas compared to those of other investigators.

The seminars were very useful and informative, with some excellent sessions on biofilms. I was particularly impressed by data presented by **Roberto Kolter**, from work on biofilms of *Bacillus subtilis*. Kolter has been investigating spore formation in this organism while in the biofilm mode of growth, and was able to demonstrate that *B. subtilis* biofilms develop specialised areas where spore formation occurs.

As with the poster session, the seminars were also a good way to pick up new methods and get ideas for my own work.

When I managed to get a spare moment (which wasn't often!) I would take advantage of the ASM international lounge. Access was restricted to overseas participants, and provided as much free tea, coffee, or soft drinks as I could consume, as well as snacks in the morning and afternoon. Fully recharged, I was then able to take a look around the trade fair, which contained exhibits from a wide variety of companies and societies, including the SFAM. Many exhibitors offer a free gift as an incentive to visit their stand, and pretty soon I had a substantial collection of amusing pens and desk toys.

In conclusion the ASM annual general meeting was for me a thoroughly enjoyable experience. These meetings have something for everyone and the poster sessions are a great way to present your work and network with colleagues from around the world.

Brian Jones
Cardiff University, UK

Further information
You can read more about the 2003 ASM on page 10.

Anyone who has ever attended an ASM General Meeting will have been faced, at some point with the problem of wanting to be in at least two places at the same time. With somewhere in the region of 300 individual symposia, colloquia, special lectures and poster sessions spread over four days to choose from, the ASM General Meeting provides a bewildering source of microbiological riches as well as the possibility of information overload. Careful planning is a necessity, although frequently it's the lectures which one least expects that leave a lasting impression.

This was certainly the case with the Sunday opening session, which included a special set of talks on highly topical infectious diseases, including SARS. The audience was presented with a fascinating study of the outbreak of SARS in Toronto earlier this year. The story of how the routes of infection were traced back from each individual case to the Toronto index case was an example of a meticulous epidemiological investigation and, with further cases reported subsequent to the main outbreak, this story may yet run for a little longer.

The ASM Lecture which followed gave an interesting insight into smallpox. As a disease which could arguably have been consigned to history had all remaining viral stocks been destroyed, in the U.S. especially, it is clear that the whereabouts of some of these stocks is causing great concern.

The conference proper provided many relevant talks to attend, covering my main research interests; those of biofilms and *Pseudomonas aeruginosa*. There was much coverage of *P. aeruginosa* biofilm formation, dispersal of biofilm cells and the morphological variants that can be isolated from such structures, with interesting offerings from **Roberto Kolter, Matthew Parsek, Peter Greenberg** and **Pradeep Singh**.

Daniel Hassett gave a breakneck speed account of anaerobisis in *P. aeruginosa* biofilms and how this organism's Rhl quorum sensing system may play a role in avoidance of nitric oxide-mediated cell death. With *P. aeruginosa* able to grow anaerobically in the lungs of cystic fibrosis patients, interference with bacterial cell signalling will continue to be a vital area of research with the potential of disrupting biofilms - a much sought-after goal.

It was the more wide-ranging lectures, however, that made a surprising impact. ASM President **Ronald Atlas's** address, *'From Bioremediation to Bioterrorism'*, covered a good deal of ground, from microbiological to political issues. The recent anthrax attacks, as Dr. Atlas pointed out, made microbiologists "both suspects and saviours" and, at the height of the scare, he was dealing with 70 press calls per day instead of the usual handful. He recounted how scientific openness came into question with criticism from some quarters regarding the extent of information that the ASM published on their website. Inclusion of details on *Bacillus anthracis* resistance to ciprofloxacin, the agent given prophylactically during the anthrax scare, was viewed by some as tantamount to presenting a national security risk by arming terrorists with useful information. Censorship was also hotly debated during this period, with some authors suggesting that their methods might not be published and even, in some cases, that their results might be withheld! Common sense prevailed, however, and the ASM refused such self-censorship, laudibly saying that such acts would undermine science. Nevertheless, Dr. Atlas made it clear that the ASM would act as a whistle-blower if controversial material was submitted where the potential harm outweighed the potential benefits. In the last year, of 14,000 articles submitted for publication, 224 involved "select agents", and of these, only 2 caused sufficient concern for all 11 ASM journal editors-in-chief to meet and suggest modification. Dr. Atlas finished with a call for microbiologists to communicate "with reassurance as well as accuracy" when faced with questions by the press and the public. He had certainly faced plenty following the U.S. Homelands Security chief's pronouncement that everyone should buy duct tape and plastic sheeting to afford themselves some protection in the event of an act of bioterrorism. Immediately the press 'phonecalls to the ASM began, asking about the use of this duck tape...

The President's Forum, two evenings on, continued with this theme of communication of science and public fears. However, with yet another President (George W) due to arrive that evening a decision was taken by our contingent to vacate the building and retire to the pub (in the interests of safety). With 300 beers to choose from, we were there for some time...

As a recipient of a President's Fund grant, I was attending the Meeting to present a poster which resulted from vacation student projects, in part funded by the SfAM. I extend my grateful thanks to the Society for supporting this research.

Shona Nelson
University of the West of England, UK

The meeting began on Sunday 18th May with an opening lecture given by Dr **Donald Henderson** entitled *"The Smallpox Saga: A Chapter not yet Written."* Following this, there was a reception for delegates.

The conference included lectures, workshops and poster sessions covering many areas of microbiology. Presenters took advantage of the excellent facilities in the newly built Washington Convention Centre, such as the interactive symposium presented by medical microbiologists. In this session, case studies were presented and at regular intervals the audience were invited to vote on electronic keypads for the tests they would prioritise, and the most likely aetiological agent of the disease. The resulting votes were presented on a screen at the front of the lecture theatre. The outcome indicated that some of the more rare pathogens encountered in the clinical laboratory environment are very difficult to isolate without specialist knowledge.

The subject of bioterrorism was very high on the conference agenda, and there were numerous sessions covering different aspects of this topic. Many sessions focused on new research with *B. anthracis*, and changes in laboratory practices in the USA as a result of increased bioterrorism threats.

The poster sessions also covered a wide variety of topics, and I had the opportunity to present a poster of my research entitled *"Bacterial Cross-Resistance to Antibiotics and Biocides: A Study of Triclosan Resistant Mutants"*. The poster session provided a valuable opportunity to meet and discuss the issue of cross-resistance with other members of the microbiology community who were also

interested in this topic.

A talk by **S B Levy**, from Tufts University and *"The Alliance for Prudent Use of Antibiotics"* entitled *"Antiseptic Resistance: Relationship to Antibiotic Resistance"* was also of great interest. Central to Levy's lecture was the concept of lowering the use of biocides for applications where they have not been proved to prevent infectious disease or to lower rates of infection. He described studies that have shown the possibility that target sites of antiseptics and antibiotics might be the same, and thus resistance to one agent would confer resistance to another agent. Levy identified many household products containing antibacterial agents that have not been shown to be more capable of reducing levels of infection compared with the traditional 'soap and water' approach to hygiene. The talk aroused much interest from the audience judging by the many questions and comments given at the question and answer session after the talk, from people both supporting and challenging Levy's conclusions.

Apart from the very low priority given to global microbiology issues the conference covered many key issues for microbiologists from a variety of research and clinical backgrounds, and was very interesting and enjoyable.

Alison Cottel
University of Brighton, UK

Could you benefit?

The President's Fund is open to Society members of all ages.

For further information see the panel on page 36 or visit the website at :

www.sfam.org.uk

In Situ and On-Site Bioremediation: The 7th International Symposium

June 2nd -5th, 2003. Orlando, Florida, USA.

June 2nd, 15.30, 31°C. Leaving Orlando International Airport for the conference venue, the fantastic Coronado Springs Resort in Walt Disney World, was like opening the an door. However, there was no time to take in the rays after travelling to the hotel and unpacking before attending the speaker's reception held in Disney's Animal Kingdom World.

The following day the conference started promptly with the plenary sessions at 08.00. Luckily the time difference (-5 hours) suited me as it was just like getting up at lunchtime. After a brief opening by the symposium chairs, **Victor Magar** and **Mark Kelley**, **Edward O Wilson** gave his keynote address on *'[The Future of Life'*. Other plenary talks followed, including *'Microbial life with chlorochemicals: From gene to the field'* (**James M Tiedje**), *'Restoring America's Everglades: Meeting the challenge'* (**Naomi Duerr**) and *'Efficacy and maturity of bioremediation for environmental restoration'* (**Dr Robert E Hinchee**).

In the afternoon the platform sessions began. Over the four days of presentations there were five concurrent presentations from 08.00 until 17.00 (with one afternoon off for short courses). These sessions were organised so that related areas would not crossover, and I found that there was usually something worth going to listen to, even if not directly relevant to my work. Over 50 subject areas were covered with between 5 and 8 speakers per topic. There were around 1500 scientists and engineers in attendance. The diversity of the talks ranged from those on bioremediation / biodegradation of various compounds, through associated techniques (such as molecular and isotopic methods) to real world solutions and problems.

My presentation, *'Biodegradation of synthetic pyrethroid dip insecticides: A three year study'* was scheduled third in the *'Bioremediation of pesticides'*, one of the first afternoon platform sessions. At the end of the session there was a short break before the first of the two poster presentations (the other being on the second evening). I was presenting a poster *'Bioremediation of a creosote contaminated site'* in the *'Bioremediation of PAHs'* section. The accompanying light refreshments turned out to be what was fast approaching a three course meal and during the presentations much networking occurred resulting in the mass swapping of contact details. Despite an almost 12 hour conference day, the light and warm evenings allowed for further discussions outside with a cold beer around the resort lake or even in one of the many water pools! If people didn't want to be outside then there were the finals of the Ice Hockey and Basketball championships to watch on television.

There was a large exhibition hall attached to the conference, where food and drink was served, but this was mainly for the large exhibitions and demonstrations by the various companies (both science and engineering based). It was also a great source to pick up literature and learn about the latest commercial developments first hand.

The following day after the official end of the conference there was a special trip to Cape Canaveral. Approximately 40 of the conference delegates, including myself went out to one of the launch sites where we could see at first hand many of NASA's bioremediation treatments. These were on sites contaminated with a variety of persistent and recalcitrant chemicals, mostly from rocket cleaning and aviation sources. It also allowed for some fabulous photographs to be taken much closer than the public can get. The rest of the day allowed us to see more of the tourist complex.

Luckily many of the attractions in Disney World were open until late at night which allowed delegates to see more of the World where they were actually staying. This was not a 'Mickey Mouse' conference as many of my friends would have put it, although I did spend all of my spare time going on rides and eating ice cream.

I would like to thank the Society for Applied Microbiology, the Society for General Microbiology and University College Dublin for funding my attendance at the conference, without which it is doubtful that I would have been able to attend at all. I also thank the organisers, Battelle, for making the conference so enjoyable.

Russ Grant
Department of Industrial Microbiology,
University College, Dublin

Further information
Further details of this conference can be found at: www.battelle.org/biosymp

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Microbiological Consultancy

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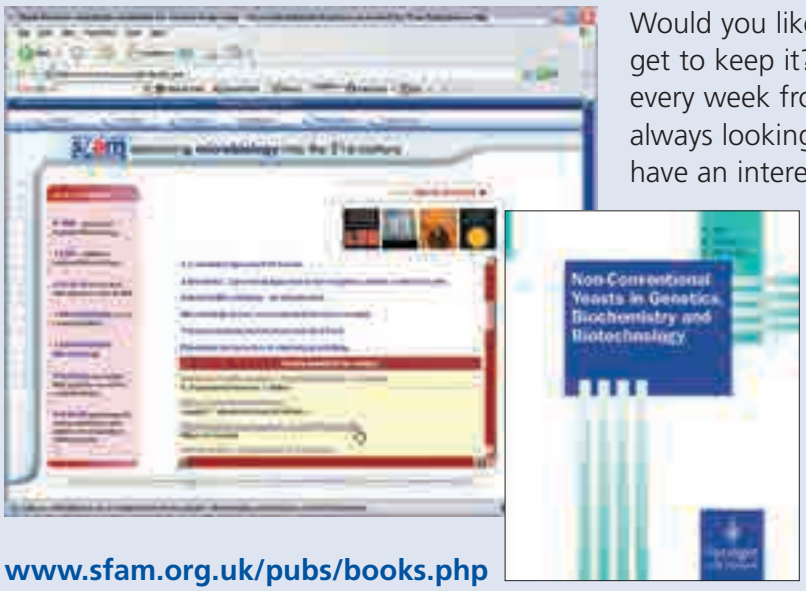

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Building and refurbishing food production areas

new guidance from CCFRA

Two new guides from CCFRA will help food construction companies building or refurbishing premises to avoid costly mistakes with their hygiene design and construction and better assure the safety of their food products. Produced with the close involvement of food and construction industry specialists, Guidelines for the hygienic design, construction and layout of food processing factories (CCFRA Guideline No. 39) looks at the food hygiene related issues associated with building, adapting or refurbishing a food factory as a whole, covering, for example, site location, estimating the size of the factory required, planning the flow of materials and people, and developing the construction brief. The accompanying Guidelines for the design and construction of walls, ceilings and services for food production areas (CCFRA Guideline No. 41 – second edition) looks at the construction principles for walls, ceilings and utility services for food production areas, providing practical advice on construction of external and internal walls, preparation of backgrounds, movement joints, finishes, coving and protection, openings including doors and windows, ducts, ceilings, services and pest proofing.

Both guides are aimed at anyone considering building, renovating or refurbishing food production areas and complement CCFRA's existing Guidelines on the design and construction of floors for food production areas and Guidelines for air quality standards for the food industry.

Further information

■ Further details are available from Mrs Sue Hocking, CCFRA Publications Officer.
Telephone: +44(0)1386 842225
Email: pubs@campden.co.uk
Website: www.campden.co.uk

Modern Statistics for the Life Sciences

By Alan Grafen and Rosie Hails
Oxford University Press, pp 351
ISBN 0-19-925231-9
reviewed by Richard Armstrong

THERE IS A LACK of useful statistical texts that enable experimenters to analyse their data efficiently and accurately and consequently, this book is greatly to be welcomed. Most statistical texts fall into one of two categories, either they are simple introductions to the subject and therefore not complete enough to avoid major pitfalls or are too difficult and complex to be useful to the investigator who may be not knowledgeable of the minutiae of statistics.

The present book achieves a balance between these extremes in being extremely readable and also detailed in its coverage in albeit, a restricted range of data analyses. The reason for the restricted coverage is that the text uses the 'General linear model (GLM)'as the foundation to explain parametric statistics. As a consequence, the book deals mainly with analysis of variance (ANOVA) and regression, by far the most useful data analysis methods available to experimenters. A second novel feature of the book is the use of geometrical diagrams to explain statistical concepts such as the meaning of interactions.

The book comprises 14 basic chapters together with various summaries and is richly illustrated with example data sets for analysis. It begins with an introduction to ANOVA (Chapter 1) and regression (Chapter 2) followed by a discussion of the usefulness of GLM in expressing the basic models of parametric

statistics as linear equations (Chapter 3). The extension of the methods to more than one explanatory variable then follows (Chapter 4) and then the importance of correct experimental design, including how to reduce error variance and increase 'power' (Chapter 5). In addition, Chapter 5 considers the important question of 'pseudoreplication' and the importance of orthogonality. Chapter 6 deals with the distinction between continuous and categorical variables and Chapter 7 with factorial experiments, the nature of interactions, and introduces covariance. The assumptions necessary for the correct application of these analyses are then considered in detail together with a discussion of the commonly used 'repeated measures' design which appears to invalidate the assumption of independence of observations (Chapters 8/9). The use of data transformation methods is also discussed. Chapter 10 discusses the criteria that are important in selecting the correct model for analysis while Chapter 11 extends the analyses to multiple regression including stepwise methods. The complexities of 'fixed' and 'random' effect factors are then discussed in relation to 'nested' designs and 'mixed' models (Chapter 12). Chapter 13 introduces contingency tables and the chi-square distribution for analysing frequency data and the book concludes with a consideration of related statistical problems requiring further solution.

The book has many advantages including its readability, the use of GLM and geometrical diagrams, and the direct link it establishes between the theoretical exposition of data analysis methods and the commonly available statistical software based on these methods such as Minitab, SAS or SPSS. If there are disadvantages as far as microbiologists are concerned, it is the inevitable restriction of the topics covered, which may not deal with many of the techniques most useful in microbiology such as non-parametric statistics. A second reservation, as a teacher of statistics, is whether undergraduates and postgraduates in microbiology will find it any easier to understand ANOVA based on a GLM approach compared with more traditional methods. A final minor criticism, and a personal prejudice, involves the advice given as to the analysis of commonly used repeated measures designs. The authors indicate that this type of design should be analysed as a multivariate ANOVA (MANOVA) with each time interval to be considered as a Y variable, because of the invalidation of the assumption of independence. This advice may be too strict, as the authors themselves also seem to accept, and an alternative method of analysing such designs is a repeated measures ANOVA with partitioning of the interaction sums of squares into response curves or response surfaces. This method has the advantage of being able to test the interaction between the time trend and the major factors. In conclusion, this book enriched my knowledge of ANOVA and I would recommend it to any investigator wishing to analyse experimental data and who already have some knowledge of ANOVA and related methods.

Dogs, Zoonoses and Public Health (2000)

C N L Macpherson, F X Meslin and A I Wandeler. CABI Publishing. pp. 382 + xii. ISBN 0-85199-436-9 £65.00
reviewed by Jonathan Caddick

AS THE SAYING GOES, "never judge a book by its cover," and I don't believe there is a finer example for which this old adage holds true! At first glance this book is not appealing. The dull, black and white picture, which makes up the front cover, with the purple and blue title blocks is entirely uninspiring. However, this said, once past the binding an extremely informative and well-constructed piece of literature awaits!

This book is a detailed study of the evolution and social development of the canine on a global scale specifically related to the beneficial and detrimental roles of dogs in human life. Particular emphasis is placed on canine zoonotic potential in public health, with detailed chapters covering dog zoonoses.

The book opens with the first chapter outlining the evolution and domestication of the dog and the development, over time, of the dog-human relationship. Also collected here is evidence supporting the concept that dogs as companion animals are good for human health and are potentially, "therapeutic." Aspects of canine ecology and population biology are discussed in the following chapter setting the scene for the place and role of dogs in human life in different countries and continents. Later on, past the areas covering zoonoses, there are chapters devoted to dog population management and control of zoonoses in dogs. I expected these chapters, not associated with disease, to be quite uninteresting. However, I was pleasantly surprised to discover that they were actually very educational.

The sections dedicated to dog zoonoses are divided into individual chapters that cover disease from viruses to bacteria, protozoa, various worm infections and finally other parasitic organisms. Each area is introduced and discussed in detail. The chapters are informative, concise and carefully summarised with the relevant references set out at the end of each section. Every aspect, as far as I am aware, of dog zoonoses is covered within this book.

Thankfully the authors have taken the time to compile a book that is both interesting and accessible to the reader. All the material is extremely well written and flows pleasantly, absorbing the reader encouraging you to read on. This book will certainly serve as an excellent source of reference material for anyone working in public health or anyone with a particular interest in this area.

Fungi in Bioremediation

G M Gadd (Ed.)
Cambridge University Press
reviewed by Louise Fielding

THIS BOOK COMPRISES 17 chapters written by a wide range of experts from around the world. It has a target readership of mycologists and microbiologists as well as professionals in environmental sciences, ecology and biotechnology. The text would not generally be accessible for undergraduate students except those following a specific mycology course but would be suitable for academics in the applied fields mentioned as well as food scientists and technologists.

The preface of the book outlines the growing importance of bioremediation. Much of the information currently available is concerned with the exploitation of bacteria as bioremediation agents and this text attempts to

highlight the importance of the use of fungi in this field. The first chapter provides a concise but fairly comprehensive background to the degradation of plant cell wall polymers by fungal enzymes. The text is illustrated by a number of chemical structures, schematics showing reactions and electron micrographs of some aspects of degradation. This information is extended in the second chapter which deals with the biochemistry of ligninolytic fungi. The different classes of pollutant that this type of fungi are effective against are described and this is followed by an in depth discussion of each enzyme involved, factors affecting the performance of the enzyme and the mechanisms of action. This chapter also explores the use of enzyme systems as opposed to whole organism-based methods. White rot fungi specifically are the subject of the third chapter which introduces the organism and details its range of uses in bioremediation.

The majority of the remaining chapters look at specific applications of fungi in bioremediation. Specifically, the chapters explain the remediation of soils contaminated with persistent organic pollutants, degradation of chlorinated monoaromatics and BTEX compounds, bioremediation of polycyclic aromatics, pesticide degradation, degradation of energetic compounds, decolourisation of dyes and industrial effluents, agricultural waste conversion, cyanide degradation, metal transformations and bisorption and heterotrophic leaching. The general pattern of each chapter is that the authors outline the problem, detail the effect of the pollutant on the environment and the population then detail the effect that different types of fungi have upon the pollutant. The text is generally well illustrated by chemical formulae and structures, reaction pathways and each section is well referenced.

The remaining three chapters are concerned with more general applications. Chapter five looks at the formulation of fungi for *in situ* bioremediation. The development of both bacterial and fungal models is outlined and the specific use of white rot fungi is discussed. The chapter concludes by investigating the use of encapsulation of fungi for bioremediation. The last two chapters discuss the potential for using mycorrhizal associations in soil bioremediation, and specifically for hydrocarbons. The use of plants to facilitate bioremediation is investigated in some detail in terms of the rhizosphere effect and its effect on mycorrhizal fungi is explored.

The text is well presented and generally presented in a logical order, although some chapters may be better earlier in the book. Much of the work presented is in the form of reviews of previous work but there is also a significant amount of new research. As this is a compilation of chapters from a number of different authors, it is inevitable that there is some duplication of information. The editor has, however, managed to keep this to a minimum, ensuring that the reader is led through a number of related chapters with little repetition. The book is part of the British Mycological Society Symposium Series. Society membership is open to anyone with an interest in fungi 'whether professional or amateur.' Many amateur mycologists may find the text challenging as it is written by experts in the field seemingly for other professionals rather than for the amateur.

PCR Detection of Microbial Pathogens

Konrad Sachse and Joachim Frey (Eds)
Humana Press
reviewed by Louise Fielding

PCR ETECTION OF MICROBIAL PATHOGENS is part of the Methods in Molecular Biology series and is aimed at microbiologists, veterinary diagnosticians and food analysts. It is written to assist these professionals in decisions regarding the implementation of PCR technology into their respective fields. The book brings together the range of current procedures and aims to compare and critically evaluate these protocols so that the optimum methodology can be determined.

The book is divided into two sections, the first dealing with reviews while the second is concerned with protocols. There are four reviews, each dealing with a different aspect of the technology. The specificity and performance of diagnostic PCR assays is discussed in terms of the selection of target sequences, the efficiency of the amplification reaction, methodologies to improve performance of the amplification assays and practical implications of the routine use of PCR. The chapter on the pre-PCR processing of samples comprehensively covers PCR inhibitors, sample preparation, DNA polymerases, amplification facilitators and pre-PCR processing strategies. The chapter covering the standardization of PCR is very useful as it deals with the practicalities rather than the scientific aspects of standardization. It discusses the FOOD-PCR research project, which recognises the need for a focused strategy to attain standardization. The final review is concerned with the application of PCR to zoonotic food-borne bacterial pathogens. It compares traditional culture techniques with PCR and outlines the fundamentals of the PCR process. The review section is full of useful information for all wishing to embark upon PCR and is accessible to those with limited theoretical and practical knowledge of the technology.

The second section of the book looks at specific protocols and applications of PCR technology. Examples of chapters in this section are the detection, identification and subtyping of *Actinobacillus pleuropneumoniae*, isolation and identification of *Campylobacter* (although traditional isolation techniques are used here which are not always reliable), PCR-based detection of *Coxiella burnetii* from clinical samples, detection of pathogenic mycobacteria of veterinary importance, multiplex PCR of avian pathogenic mycoplasmas and detection of *Salmonella* spp. There is a good balance between clinical, veterinary and food related protocols and each chapter follows the same structure – introduction, materials, methods and notes, to allow the reader to easily follow the protocols presented. The protocols are comprehensively constructed and it seems that they would be easily reproducible in the laboratory. There are full lists of the material requirements, quoting the chemicals to be used, the working concentrations and the supplier, where appropriate. The methods detail the sample collection, preparation, DNA isolation techniques, amplification and electrophoresis techniques. The notes section highlights some of the problems which may be encountered and steps which may be taken to avoid or overcome such problems.

The book claims to provide information on readily reproducible

techniques, state-of-the-art methods for animal and human microbial pathogens, step-by-step instructions to gain robust results and tips on how to avoid pitfalls and suggestions for alternatives. The text fulfils these claims and can be recommended for anyone in the PCR field or those wishing to develop this technology for research or routine analytical purposes.

Biofilm Community Interactions: chance or Necessity (2001)

Edited by Peter Gilbert, David Alison, Melanie Brading, Joanna Verran and Jimmy Walker. Cardiff: BioLine, pp370 £35. ISBN 0-9520432-9-7
reviewed by Karen Stanley

SINCE THEIR INAUGURAL meeting in 1993, the biofilm club have published the papers of their annual meetings. Manuscripts are written, edited and printed in book form in time for the meeting which reflect current research in the biofilm field. 'Chance or necessity'or 'BBC5' as it is referred to in the preface, is the fifth book in this series and compiles more than 30 varied articles from 92 researchers around the world, some of whom have significant research interests outside the biofilm field. This book is an invaluable contribution to the biofilm literature and is of immense use to biofilm researchers.

The focus of 'Chance or necessity' is on biofilm community interactions and biofilms as complex, dynamic communities. The work presented draws from diverse backgrounds including the food and water industry, and workers with clinical, dental, environmental, ecological, geological, and pharmaceutical interests. The 34 papers are distilled into five logical sections; Water and Environment, Matrix Polymers, complex communities, resistance and control and the quirkily titled, 'Piles to Smiles' which deals with microbial community structure and interactions in the large intestine, on skin and in the mouth.

Papers vary considerably in style, length and content. Many are short presentations of previously unpublished data while others are highly informative and some include invaluable technical details on method development. The range of subject areas, research foci, data formats, micro-organisms and methodological approaches is overwhelming yet the editors have threaded these together well and the inclusion of reviews and overviews in each section gives depth to balance the breadth. The thoughtful, relevant discussions on biofilm-related ecological phenomena such as competition and selection, co-aggregation and co-adhesion convey current thinking in these areas.

This book is obviously not meant as a 'cover to cover' read but the good indexing makes it possible to dabble. What I appreciate about the standard, inexpensive, functional, non-glossy, flexible, soft bound, A5 format is that it is well balanced when held open, the pages fan well and the book sits open at the chosen page, without slipping off the desk. The monochrome reproductions are perfectly clear.

In summary, this is book of obvious interest to biofilm researchers but also microbial ecologists and should have something to offer those with an interest in understanding how bacteria organise themselves when not in liquid monoculture. I look forward to BBC6 which should be due out later this year.

"How scientists explain disease"

Paul Thagard. Princeton University Press. USA. 1999. Pp. 263
reviewed by Eric Bridson.

THE AUTHOR IS Professor of Philosophy and Director of the Cognitive Science Program at the University of Waterloo (Canada). He has drawn material from nine of his earlier publications on cognitive subjects and included 333 references.

Thagard favours disease explanation schema to cover symptoms and causes. These are arranged in hierarchical order from general to specific descriptions with arrows indicating flow and/or counter current interactions up and down the hierarchy. He likes his disease schemas divided into explanation target and explanatory patterns. The germ theory of disease is explored, followed by nutritional, auto-immune, environmentally influenced and genetic alteration diseases. Thagard tentatively extends his logic process towards a unified theory of cancer. Causal network diagrams are drawn to show hierarchical organization of the explanations. Thagard points out that medicine does not have the general principles that apply in physics. He considers that medicine could achieve unified understanding if the simple logic of his explanation schemas were adopted.

He devotes three chapters of his book to describe Warren & Marshall's long fought battle to substantiate their theory that bacteria can cause peptic ulcers. They eventually succeeded in the teeth of established opposition, who were convinced that bacteria could not survive in this highly acid organ. Proof arrived with the isolation of *Helicobacter pylori* and its demonstrated ability to survive embedded in gastric tissue.

Chapters on cognitive and social processes follow in which discovering causes for BSE, AIDS and chronic fatigue syndrome are discussed using Thagard's principles of medical analogies. Social changes of authorship and publication are discussed stressing collaboration, joint publication of knowledge, peer review of papers and the power of consensus opinions. Changes in scientific communication via the Internet are also briefly discussed.

The final chapter presents science as a complex system. This complexity derives from the heterogeneity of its parts, which includes mental theories, social organizations, new instrumentation and the living/infective cells involved plus the interactions of all these parts.

Thegard introduces DAI (distributed artificial intelligence) in this terminal section. This is a system of solving complex problems, using networks of communicating 'intelligent' computers. The author considers that both science generally and disease specifically, require attention to multiple interacting factors. He ends his book with the following bold statement *"We can maintain the realist view that science tells us about a world that is independent of our minds and societies."* Surely the boundaries of science are still confined within the cognitive limits of the human mind!

Who would this book benefit? Wise lecturers will hide it from smart undergraduates because every lecture could become discursive chatter on medical semantics.

Postgraduate studies on complexity and chaos might welcome this attempt to explain disease and its consequences. Mature experts raised with conventional medical teaching may see this book as a mixture of naïve simplicity and arcane complexity. Readers may be better informed about complex interactive systems by studying this book but it is uncertain how many will become wiser. I closed the book and recalled the Welsh expression "There's cleverness for you!"

Biofilms: The Good , The Bad, and the Ugly

Contributions made at the Fourth Meeting of the Biofilm Club. Edited by Julian Wimpenny, Peter Gilbert, Jimmy Walker, Melanie Brading and Roger Bayston. BioLine.
reviewed by Irena-M Olejnik

THIS BOOK IS THE FOURTH in a series compiled from papers presented to the (4th) Biofilm Club Meeting of September 1999, held at Gregynog Hall, Powys. The content reflects the themes offered by contributors and covers four main areas of biofilm research i.e. medical, industrial, physiological and ecological. The material from this conference continues to provide an excellent starting point for those coming in to the field as well as being a useful reference for scientists currently in biofilm research.

Each section of this volume reflects the theme of a Session and starts with a view of that Session. In total, forty-one papers are presented covering the work of over one hundred different authors. A detailed list of references is provided at the end of each paper.

The enormous importance of biofilms in modern science and the biotechnologies makes these reports of value to people outside pure science with different levels of knowledge. My attention was first drawn to this volume when advising a student preparing a dissertation on buccal biofilms who was applying to enter the field of dentistry. Therefore, I consider this volume as well as previous Club reports to be good sources of information for under-graduates as well as those in career posts.

The arrangement of the text allows the reader immediate access to areas of personal interest whilst the short abstract before the main report encourages students to obtain a more complete perspective.

The graphs are clear and easily read, although some of the biofilm epifluorescent micrographs are a little difficult to interpret due to insufficient contrast. The atomic force micrographs and schematic representations are clear, informative and pertinent and enhance an understanding of the text. The language employed is straightforward without excessive jargon and each acronym is explained as it arises.

In conclusion, the papers offered in "The Good, The Bad and The Ugly" exemplify the (scientific) excitement that all good science should engender.

GENETICS – Analysis of Genes and Genomes 5th Edition (2001)

Daniel L Hartl & Elizabeth W Jones. Jones and Bartlett, Sudbury, Massachusetts, USA
reviewed by Lucy Harper

BEING ONE OF THE RECOMMENDED texts on many Biological Science courses run by Universities across the UK, 'Genetics' must surely be a high quality textbook. In fact it is recommended that students of some Universities purchase 'Genetics' as a core text and this is a realistic expectation as the Hardcover costs a mere £29.99.

'Genetics' is useful as a reference text and an introduction to contemporary techniques and concepts.

As experts in their field, the authors claim that this edition of 'Genetics' should show an integration between the three sub-disciplines 'classical', molecular', and 'population' genetics.

Overall, the book takes the reader through all the basics of modern genetics theories and concepts. The concept of DNA – genetics at a molecular level - is combined with an overview of the many experimental tools used by geneticists and explanations of how the genotype can relate to phenotype. The relatively contemporary concepts of genomes and proteomes are also introduced. The simple and interesting introduction to a topic that can be hugely daunting grabs the readers' attention and encourages one to read on. In later chapters the more involved molecular biology of gene expression, molecular mechanisms of gene regulation, functional genomics (including a clear explanation of DNA microarrays), through to genetic control of development, and complex inheritance are covered in an interesting manner. An aspect of this text that sets it apart from many other textbooks is the way it encourages the reader to see the 'bigger picture' by putting scientific developments into an ethical context.

The beginning of every chapter reviews the essentials of the previous chapter and outlines the major topics to follow in the next. At the end of each chapter are sections designed to both reinforce and test the knowledge acquired, including a complete summary, a list of 'Key Terms', and several question/problem sections relating to the content of the previous chapter. These are sections one would expect to find in any good textbook. However, in addition each chapter concludes with a 'GeNETics on the web' section which provides links to numerous related Internet resources. Although many fundamental sites are included in this tool other equally important ones are omitted, and I couldn't help but feel a little disappointed by the number of links which were unavailable.

The 'Further Reading' list and references provided in the 'Connection' sections are both historic and novel and provide sound and balanced background reading. To assist understanding, there is a comprehensive 'concise dictionary of genetics' at the end of the book.

The cover is a demonstration of the contemporary nature of the contents and this theme continues throughout the book. Appropriate contemporary images illustrate the text, and clear and colourful diagrams assist in putting it into context.

Although plenty of laboratory techniques are described, this is not a laboratory manual and should be used in conjunction with a practical guide if laboratory techniques are required.

In summary 'Genetics' is a clearly written text book that comprehensively covers all the basics of modern genetics in an interesting and original way that retains the reader's interest yet allows them to skip sections without loss of meaning or context. I would recommend this text to any undergraduate of the life sciences.

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The website is the best source of detailed information on the Society and it's many activities. It has a lively discussion forum and fully interactive membership areas where you can book your place at Society meetings find and advertise jobs, display your CV and much more.

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Publications

The Society publishes two monthly journals: ***Journal of Applied Microbiology*** and ***Letters in Applied Microbiology.*** We also produce our own quarterly in-house colour magazine: ***Microbiologist***, which contains features, reports topical news stories and full details of our meetings. The Society is also a partner with Blackwell Publishing in the bi-monthly journal ***Environmental Microbiology.***

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Synergy is an online service provided by Blackwell Publishing that gives Full and Student Members **FREE** access to the online versions of the Society's three journals: ***Journal of Applied Microbiology***, ***Letters in Applied Microbiology*** and ***Environmental Microbiology***. Members can register for this service at http://www.blackwell-science.com. Members can also submit papers directly to our journals via an online submission service.

For more information about Synergy or online manuscript submission, please visit the website.

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Many awards and prizes are available to members including the **W H Pierce Memorial Prize** and Prizes for Student Oral Presentations and Posters at the Summer Conference. In addition to these substantial awards, the Society has funds to assist members in their careers as microbiologists. These include **The President's Fund**, Conference Studentships, Sponsored Lectures and the popular **Students into Work** Scheme.

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