December 2004

SLTB Newsletter

****STOP PRESS****

Membership and Annual Fees

As the year moves towards its end it is the Treasurer's job to remind you that your SLTB membership has to be renewed for 2005. A Standing Order through a current bank account is the most efficient and convenient way to make your payment of £20 for standard membership or £15 for students. At present the Society is unable to accept payment by credit or debit card. A Standing Order Form is available at http://www.sltb.info/forms.htm and if you do not already take advantage of this facility I would urge you to complete the form and forward it your bank as soon as possible. If you are an established Standing Order user please would you ensure that this has been adjusted to the current rate.
Alternatively, payment can be made by cheque [increased to cover any bank service charges] made payable to the Society and sent directly to me, Brian Grout-SLTB Treasurer, Postgraduate School, Writtle College, Chelmsford CM1 3RR, UK.

Gift Aid Declaration

Since the SLTB became a registered charity in the UK in 2003, we can now reclaim tax on our UK members' subscription payments from the Inland Revenue. To enable the Society to do this, we need members to declare that you would like the Society to treat your subscriptions as Gift Aid donations. I would like to urge UK members (tax payers only) to fill in a Gift Aid Declaration form (available from the website at http://www.sltb.info/forms.htm) as this will greatly help the Society's balance sheet!

Brian Grout, Treasurer

New Committee Members

M. Elena González Benito
(egonzalez@agricolas.upm.es)
First of all, I would like to thank those of you who supported me in the election. As Committee member I will try to promote the Society for Low Temperature Biology in my country (Spain), as, so far, there are only three Spanish members in the Society. I think it is important to make the Society as international as possible, as it is already interdisciplinary. This widening will enrich us all.

My first contact with cryopreservation was through a practical course (1991) organised by colleagues (Erica Benson, Paul Lynch, Keith Harding) I had met at the University of Nottingham carrying out my PhD (1987-1990) on plant *in vitro* culture. It was an intense and very fruitful week. That was the starting point of my interest in cryopreservation. I was working

at that moment (and I am still) on the micropropagation and *in vitro* storage of some plant endemic species at the Department of Plant Biology in the Universidad Politécnica de Madrid (www.upm.es), where a seed bank with approximately 3,500 accessions of endemics is run and there is an interest on wild plant germplasm conservation. My first cryopreservation works were on cryopreservation of *in vitro*-grown shoot apices of *Artemisia granatensis* and *Centaurium rigualii*, two Spanish endemics. From there my interest spread to the cryopreservation of embryonic axes of recalcitrant seeds and of orthodox seeds, as a way to increase their longevity in seed banks (of special interest for those endemic species with small populations or that produce few seeds). My work has also included managing research grants where seed collection, storage and germination studies were considered. Presently I am working on seed preservation, on the study of the genetic stability of cryopreseved apices and on *Fragaria* cryopreservation. For further information about my curriculum vitae, please visit http://www.agricolas.upm.es/organizacion/departamentos/Egonzalez/.

Brian Grout
(bwg@writtle.ac.uk)
I came into low temperature biology in the mid 1970s through an interest in frost injury in vegetable crops which, helpfully, provided an introduction to the SLTB. Meeting with colleagues in the society led to a significant volume of collaborative work on micro-algae and mammalian cells as well as seashore invertebrates and seeds of semi-tropical plants. Following a number of years in commercial biotechnology, where cryobiology of molluscs and fish played a large part, I am back in a land-based institute with new research interests. Current projects include low temperature studies on horse sperm, freezing of tropical fruit tissues and plant cryoconservation of European currants as well as native plants of Eastern Africa and Central Asia.

New Member Profiles

Birgit Glasmacher, Ph.D. M.Sc.
(glasmacher@hia.rwth-aachen.de)
Dr. Birgit Glasmacher is currently a Senior Scientist at the Helmholtz-Institute for Biomedical Engineering at Aachen University of Technology (RWTH Aachen), Germany. She is head of the Department of Cryobiology & Biomaterials. She received her diploma in chemical/process/mechanical engineering from RWTH Aachen and her MSc in Biomedical Engineering from Dundee University, UK. Birgit Glasmacher was awarded her PhD at RWTH Aachen after submitting a thesis on the calcification behaviour of polyurethanes in the cardiovascular system. She extended her research work as head of the Department of Biomaterials on the calcification behaviour of biological heart valve prostheses and materials & stress-related blood damage. In 2001 she became head of the interdisciplinary Department of Cryobiology & Biomaterials. She is a lecturer for Cryobiology, Biomaterials, Biomedical Engineering, and Implant Science. She likes to put effort in the expansion of student exchange programs between universities, institutes, and companies of SLTB-members for study and practical training. One of her main research interests is in the cryopreservation of tissue engineered constructs with freeze-dried biomaterial-matrices. Besides SLTB, Dr. Glasmacher is a BOG-member of the Society for Cryobiology (SCF), member of the European Society for Tissue Engineering (ETES), the European Society for Artificial Organs (ESAO), the German Society for Biomaterials (DGBM), and the German Society for Biomedical Engineering (DGBMT). She co-organized the annual meeting of the European Society for Artificial Organs in Aachen in 2003.

Bruce Knowles
(b.knowles@abertay.ac.uk)
Bruce is currently a lecturer in information systems, recently transferred from the School of Computing to Dundee Business School at the University of Abertay Dundee. He has a BA in Business Studies and an MSc in Computing, and is a chartered member of the British Computer Society. On leaving school, he joined the Royal Fleet Auxiliary Service and completed a tour of duty on numerous

postings in the Far East. He began his current career as a trainee computer programmer in 1976, eventually becoming senior systems analyst in Scotland's biggest whisky group – The Distillers Company, Edinburgh. He has been teaching mainly systems modelling and database design at Abertay since 1987, and has been involved in a number of both local and international consultancies. The analysis and construction of the virtual environment to support cryopreservation of algae, for the EU 5th Framework COBRA project (see SLTB Newsletter, April 2004) has been supervised by Bruce during the last two years of that project. He has a keen interest in exploring the distinction between acting as an IT specialist and acting as a scientific project team's "Knowledge Manager".

SLTB Annual Scientific Meeting 9th & 10th September 2004

A highly interesting SLTB annual scientific meeting was held at the Royal Free Hospital, London, perfectly organized by Prof. Barry Fuller and his team. A total of 53 registrants and 4 exhibitors had the pleasure to take part. The symposium on the first day was entitled "Cryopreserving Hepatocytes" and consisted of 5 lectures followed by free communications. Ursula Rauen (University of Essen, Germany) started the programme with a lecture on hypothermia as a strong inducer of hepatocyte injury. The second talk by Locksley McGann (University of Alberta, Edmonton, Canada) focused on basic cryobiological aspects of hepatocytes. Clare Pattenden (Leicester General Hospital, Leicester) highlighted the ethical, logistical, legal and practical aspects of the banking of human hepatocytes. After lunch the symposium was continued by Claire Terry (Kings College Hospital Medical School, London) who reported the first clinical data and practical aspects when using cryopreserved hepatocytes for the treatment of metabolic disorders in paediatric patients. David Stevenson (University of Strathclyde, Glasgow) presented his results with cryopreserved rat hepatocytes towards their application in a bioartificial liver support. Two symposium related free communications on the effect of hypothermic storage of isolated human hepatocytes and the cryopreservation of peripheral mononuclear blood cells completed the topic.

The SLTB AGM was held in the afternoon. It was attended by 18 members of the society (see separate minutes on the website). The SLTB Annual Dinner took place within walking distance of the Royal Free, however, probably due to the excellent food and wine served (more likely because of the latter!) I have forgotten the name of the restaurant… During the dinner David Pegg (University of York), one of the founders of the Society about 40 years ago, gave us (on request!) a humorous account about how the society was born and who was involved. At least the society's "social life" seems to be as good today as it was in the beginning.

After so much food the night before it was a pleasure to have a "vegetarian" topic on the morning of the second day (and some coffee for sure!). The symposium was entitled: "Mechanisms of Injury and Protection at Low Temperatures", and the first talk was by Paul Lynch. Paul introduced us to CRYMCEPT (see also the contribution by Keith Harding in the April 2004 newsletter). CRYMCEPT is an EU funded project and its general objective is to develop new (and improve existing) cryopreservation protocols for plant germplasm preservation. The second lecture dealt with cryoinjury in micro-algae given by John Day (Scottish Association for Marine Science, Argyll). Among other things I learned that micro-algae prefer "nice" places such as geothermal springs, hypersaline lakes, all oceans and freshwater, soil surfaces and snow (probably it will not take long until they are found in deserts as well…☺). Ten free communications followed, covering a broad area of topics. In this scenario the "Ken Hobbs Award" was contested by 6 persons from 3 different institutes. Ken Hobbs is a retired Professor of Surgery from Royal Free Hospital Medical School and has kindly offered to continue funding such an award on an annual basis, without a specific end date, at a level of £100. He was an SLTB committee member during

the 1970s and was active in the organisation of the Society for Cryobiology Meeting held in London in 1974. He worked with Charles Huggins in Boston in the early 1970s. Thank you very much, Prof. Hobbs – and this year's first winner was Natascha Hidvegi from the Department of Plastic Surgery (Royal Free Hospital). She is a PhD student and her presentation was entitled: "Isolation of normal human articular chondrocytes: a low temperature method."

Last but not least the posters should be mentioned: Approximately half a dozen were presented, most of them by students, the majority focusing on plant cryopreservation.

Many thanks, Barry and colleagues!
Andreas Sputtek, Chairman

Research in Low Temperature Biology Matures like Vintage Port

In the hurly-burly of life in science in the modern era, we all expect progress to be made in months or years, a view often nurtured by the nature of short-term grants and annual reviews. However, if we do get time to ponder some of the more philosophical aspects of science, we often see examples where ideas have been proposed, forgotten, re-evaluated and shaped anew before we can move on. Such a case is the application of low temperature biology in the cryopreservation of ovarian tissues. As the ultimate source of female gametes (the cohort of oocytes) and for physiological supply of female hormones, the biological potential of cryopreserving ovarian tissues (for example, in areas of patient treatment for infertility, animal breeding and conservation of species) has been recognised for more than 50 years. In 1942, Payne and Meyer were carrying out experiments on exposing rodent ovaries to liquid air (but without the knowledge on cryoprotection which was to come from Polge's later work on sperm and, predictably, with benefit of hindsight, without success). As soon as cryopreservation of sperm was established as a successful technology, work on ovarian tissue cryopreservation was started. By the late 1950s, the group headed by Sir Alan Parkes at Mill Hill in London was making significant progress identifying the nature of successful ovarian tissue cryopreservation, and the best choices of protocol (Deanesly, 1954; Green *et al.*, 1956). A landmark paper was produced by Parrot (1960) from the same group, in which mouse ovarian tissue, cryopreserved with glycerol, showed significant success in restoring normal female hormone cycling and even a low number of live young from thawed ovarian tissue grafts after mating. However, there seemed to be no way of really exploiting this at the time, and interest in the topic gradually fell away. I recall a discussion with some SLTB friends in the late 1970s, trying to understand Parrot's work (in the light of the difficulties being experienced at the time in cryopreserving oocytes and embryos), as to whether the results were true or some artefact resulting from how the experiments were performed. Others were more prepared to be believers, and by the 1990s Roger Gosden had definitively established that live births could result from grafting cryopreserved ovarian tissues by applying better cryopreservation technologies derived from the collective knowledge in the intervening time (Gosden *et al.*, 1994). This duly re-awakened clinical interest in ovarian tissue cryopreservation, particularly for women unfortunate enough to require ablation therapy for various cancers, which could treat the malignancy but also destroy ovarian function and lead to infertility. Now, in September 2004, we have reports in the world press (Donnez *et al.*, 2004) of the first birth of a child (in Belgium) to a woman who elected to have her ovarian tissue cryopreserved before cancer treatment, and re-grafted after successful recovery from the malignant illness. As always, new advances in reproductive cryobiology lead to new ethical questions which will have to be addressed, but this particular technology, if it proves to be truly reliable, does seem a justifiable development. As another old friend has said to me on several occasions, the only true value of any new piece of scientific research is that someone else can reproduce it. It just may take a vintner's vintage timescale to be able to appreciate it.

Barry Fuller

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Frost, Fridges and Freezers: a Chilling Experience

It's late spring at Sudbury Hall, a National Trust Property just South of Derby, and Paul Lynch has just amazed a crowd of children and parents by making ice cream in less than a minute and disappearing in a large cloud of nitrogen vapour. So ended another dramatic scientific story enacted by Paul and his colleagues, Rod Pearson and Julia Pooly, that took the audience from some 300 years in the past up to the present day with a drop from ambient temperature to –196°C, according to the large theatrical thermometer.

This is all part of an annual event organised by the University of Derby and the National Trust – "Science in Trust" day. In previous years there have been dramatic reconstructions of Victorian attempts to use atmospheric electricity to stimulate crops demonstrated with vines that grow before your eyes and the story of how longitude was measured with the help of a friendly camel. Each of the stories have a link, if a tenuous one, to Sudbury Hall and this year's story was no exception. The fact that the Hall has an ice house in the grounds was more than enough of an excuse for a "Chilling Experience".

With Rod the narrator setting the scene, the story began with Julia, as Lady Vernon, requesting a cool drink from her butler Paul (who was trying not to be as wooden as Parker from Thunderbirds!) and asking how, on such a warm spring day, he can provide such a cool drink. This provides the cue for a demonstration of dissolving saltpetre into water to reduce its temperature. With the help of the narrator time moves forward 100 years to 1800, the new Lady Vernon (Julia with a different hat!!) asks her butler (still Paul in a colourful waistcoat!) for one of the fashionable ice puddings. Naturally this leads to an explanation of ice houses and demonstrations of freezing point depression using salt. Time moves on to the early 1900s and the concept of mechanical refrigeration is explored with the help of the Sudbury Hall staff canteen fridge and Percy the penguin from the Museum of Childhood at the Hall. Now the temperature on the giant thermometer takes a plunge and time moves forward and Paul reappears in lab coat, blue cryo-apron, gloves and face shield - a scientist! - to show just how cold liquid nitrogen really is by smashing frozen daffodils while managing to get in a plug for the importance of cryopreservation in plant conservation with the help of some *in vitro* cultures and a cryopreserved strawberry plant. Naturally the audience asks about freezing bodies which is dismissed as something from Star Trek. Then it's back to the liquid nitrogen ice cream, which is a bit like creamy popcorn and loved by kids of all ages!!

Next year levers and hydraulics; (well Sudbury had a Victorian hydraulic lift) based around a circus and the world's strongest man – so some serious acting necessary!!

Paul Lynch, General Secretary

A fully protected chef makes ice cream with liquid nitrogen

Forthcoming SLTB Meetings

SLTB AGM 2005

The 2005 annual meeting of the Society will be held on September 15thth and 16th in the Biology department at the University of York. The meeting will include two half day symposia, one on the "The Molecular Response during Plant Acclimation to the Cold" and the other on "Current Challenges in Tissue Banking". There will also be time for free communications, an opportunity for poster presentations and a prize for young presenters. The AGM of the Society will be held on Thursday 15th and this will be followed by the annual dinner. York campus is located outside the city centre and accommodation on campus will be available, but ***EARLY BOOKING WILL BE ESSENTIAL*** in order to secure the rooms. Further details will be available in the New Year, so keep an eye on the website and the newsletter for further information.

We look forward to seeing you in York.
Monica Wusteman and David Pegg

CRYO 2006
Hamburg 24th–27th July

The meeting will be held as the 43rd Annual Meeting of the Society for Cryobiology in association with the SLTB. Presently discussions are underway to see if it is possible to hold the SLTB AGM on this occasion as well. In the old SLTB "rules" it said that an AGM had to be held in the UK, but the (new) constitution (see paragraph 16) does not mention this any longer. Therefore this should be possible, as long as points 1-5 in paragraph 16 are followed (see constitution on the website for details). However, the committee will discuss this on the occasion of its next meeting in April 2005 and present our opinion to the membership at the next AGM in York.

The meeting itself will cover a wide range of subjects including hypothermia, physiology of resistance to cold in plants, and applications of cryobiology in conservation, surgery, cell, tissue and organ preservation. Relevant aspects of biology, molecular biology, physics, chemistry, physical chemistry, biochemistry, physiology, medicine, transfusion medicine, mechanical engineering, tissue engineering and transplantation will also be covered. The format will be the "classic" one, i.e. a reception on the evening of the day preceding the meeting, followed by a four day scientific meeting. There will definitely be a guided bus tour of Hamburg, a combined barbeque/canoe event organized by the "International Young Cryobiology Researchers" and a banquet during the evening of the last day.

If you are interested in more details, please go to: http://www.cryo2006.org

There is a button linked to a signup form for inclusion in the mailing list and email notification of important deadlines.

Andreas Sputtek, Chairman
CRYO 2006 Organizer
(sputtek@uke.uni-hamburg.de)

Other Meetings

Fifth International Congress on Plant Biotechnology Bioveg
Cuba, February 7-11th 2005

This international meeting will be held from February 7th to 11th, 2005 in Bioplant Center, Ciego de Avila University, Cuba.
The meeting will include an International Workshop related with Plant Cryopreservation co-organised by Dr. Ir. Bart Panis from K.U. Leuven, Belgium (bart.panis@agr.kuleuven.ac.be).
Further details are available from http://192.168.11.2/Bioveg/en/default.htm

International Society for Experimental Hematology
Glasgow, Scotland
July 30th – Aug 2nd 2005

The 34th Annual Scientific Meeting of the International Society for Experimental Hematology "Tradition Meets Innovation" will take place in Glasgow, Scotland from

July 30–August 2, 2005. Details can be found at http://www.iseh.org/meetings

Re: Hyphen Required?

David,
I just received the latest Society for Low Temperature Biology newsletter and I read your short article, "Hyphen Required?" I am delighted and amused to learn that you are now paying attention to the "hyphen" issue. When I paid my SLTB dues, I always hyphenated "Low-Temperature" on my cheque, but had low expectations that anyone would notice.

However, I must take exception to any revisionism in the SLTB name, especially after four decades of use! I therefore propose a continued "hyphenless" society name, if for no-other-reason than as continuing tribute to the sensibility of our dear and beloved scientific forbear, Audrey Smith.

William F Rall
National Institutes of Health
Bethesda, MD, USA

Continental European Bank Account

The committee has agreed to move towards introducing a Euro bank account in 2006 before the CRYO 2006 Hamburg meeting. This would correspond with an appropriate publicity drive. The idea is that the account is in the present chairman's name (not the Society) to save on bank charges. Thus the resulting costs will be approx. 8 € per month (including the option of worldwide internet banking and English language). However, the Charity Commission has to be consulted to confirm that it is possible to use a private account of a trustee for this purpose. Presently there are approx. 20 continental European members of the society from several countries who have to pay individual transaction fees in addition to the fees themselves. Additionally the transaction of travel grant supports for continental European applicants will be greatly facilitated.

Andreas Sputtek, Chairman

Email Addresses – A Reminder

To help improve communication with the membership we want to develop a database of all members' email addresses. The intention is not to replace the traditional Society Newsletter with an electronic version, but rather to supplement it with specific news items etc. which we wish the membership to be aware of between the Newsletter's publication. Would you please complete the enclosed green form and post it General Secretary (Paul Lynch) or send it electronically to P.T.Lynch@derby.ac.uk – to save him lots of typing, and the inevitable mistakes.

Thank you to those members who responded to the previous requests for email addresses.

Note: The material for this edition was prepared by Monica Wusteman.

SLTB Officers and Committee 2004-2005

Chairman
Andreas Sputtek (2002)
Universitätsklinikum Hamburg-Eppendorf
Inst. für Transfusionsmedizin
Martinistrasse 52
20246 Hamburg, Germany
Tel: 49 40 42803 4277/3430
Fax: 49 40 42803 4871
Email: sputtek@uke.uni-hamburg.de

General Secretary
Paul Lynch (2002)
Biological Scis Research Group
School of Education, Health and Scis
University of Derby
Kedleston Road
Derby DE22 1GB, UK
Tel. 44 (0)1332 591748
Fax: 44 (0)1332 597747
Email: P.T.Lynch@derby.ac.uk

Meetings Secretary
Barry Fuller (2002)
University Dept of Surgery
Royal Free Hospital
School of Medicine
Pond Street
London NW3 2QG, UK
Tel. 44 (0)20 7794 0500
Fax: 44 (0)20 7830 2688
Email: b.fuller@rfc.ucl.ac.uk

Treasurer
Brian Grout (2004)
Director of Postgraduate Studies
Postgraduate School
Writtle College
Chelmsford CM1 3RR
UK
Tel: 44 (0)1245 424200
Fax: 44 (0)1245 420456
Email: bwg@writtle.ac.uk

Keith Harding (2003)
Plant Conservation Group
School of Contemporary Sciences
University of Abertay Dundee
Kydd Building, Bell Street
Dundee DD1 1HG, UK
Tel: 44 (0)1382 308535
Fax: 44 (0)1382 308261
Email: setkh1@abertay.ac.uk

Monica Wusteman (2002)
Medical Cryobiology Unit
Department of Biology
University of York
York YO10 5YW
UK
Tel: 44 (0)1904 328718
Fax: 44 (0)1904 328609
Email: mcw3@york.ac.uk

M. Elena González Benito (2004)
Dpto de Biología Vegetal
Esc Univ de Ingeniería Técnica Agrícola
Universidad Politécnica de Madrid
Ciudad Universitaria
28040 Madrid, Spain
Tel: 34 91 336 54 35
Fax: 34 91 336 54 06
Email: egonzalez@agricolas.upm.es

Compiled by Belinda Wade, Medical Cryobiology Unit, Department of Biology, University of York, UK.