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The Physiological Society Magazine

Bristol Meeting

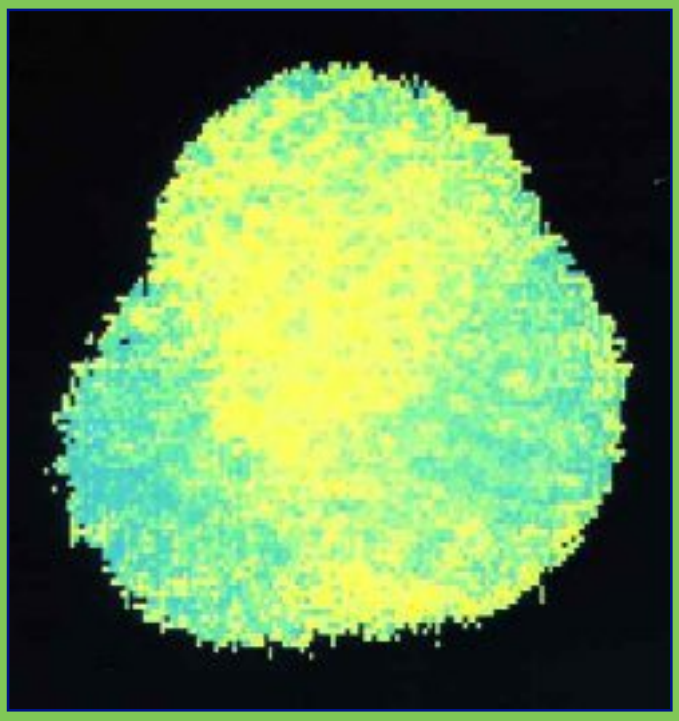
Features on:

Non-excitable cell calcium entry

Animal research – hard pill to swallow

Animals in scientific procedures – House of Lords call for evidence

The Biosciences Federation



Autumn 2001

No 44

The new Medical Science Teaching Laboratory block with the School of Medical Sciences behind

The spacious new physiology teaching laboratory in MSTL

Max Headley, currently Head of Department, desk bound as usual

Front cover: Image of increased intracellular free calcium concentration in a cluster of three lacrimal gland acinar cells stimulated with acetylcholine. The image is pseudocoloured so that "warmer" colours represent areas of higher calcium. See article by Austin Elliott on page5.

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ACTION POINTS

Affiliate Travel Grant Scheme: The next deadlines for the receipt of applications are 30 September and 30 November 2001.

MSc Bursaries: The next deadline for receipt of applications is 30 November 2001.

BSc Intercalated Bursaries: The next deadline for receipt of applications is 30 November 2001.

Change of Address: Members should inform the Administration Office of any changes of address, telephone, fax or email addresses. Changes can be emailed to: jrelf@physiology.demon.co.uk

York Meeting (17-19 December 2001): Abstracts must be submitted to the Meetings Secretary's Office by 20 September 2001.

Tübingen Meeting (15-19 March 2002): Information regarding Abstract submission to this meeting can be obtained from: www.physoc.org/meetings/future.html

Address for abstract submissions: The Meetings Secretary, The Physiological Society (Abstract Submission), Dept of Biomedical Science, The University of Sheffield, Western Bank, Sheffield S10 2TN

Magazine: Letters and articles and all other contributions for inclusion in the Winter issue should reach the Administration Office by 20 August 2001. Please cite all references in articles in the style of The Journal of Physiology.

Editor

Bill Winlow
Department of Biological Sciences
University of Central Lancashire
Preston PR1 2HE

Tel: (01772) 893 531 Fax: (01772) 892 929
Email: wwinlow@uclan.ac.uk

All contributions and queries to be directed to:
Sheila Greaves – Magazine Co-ordinator
Tel: 020 7631 1461 Fax: 020 7631 1462
Email: sgreaves@physoc.org

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GUIDELINES FOR CONTRIBUTORS

These guidelines are intended to assist authors in writing their contributions and to reduce the subsequent editing process. The Magazine Editorial Group is trying to ensure that all articles are written in a journalistic style so that they will have an immediate interest value for a wide readership and will be readable and comprehensible to non-experts. In particular, scientific articles should give a good overview of a field rather than focus on the authors' own research.

Format of articles

The main message or question posed should be introduced in the first paragraph. The background for the topic should then be established, leading up to the final dénouement or conclusion.

Length of articles

This will be determined by the subject matter and agreed between the contributor and the commissioning editor. Articles will vary in length from 500 to 2000 words.

Submission of articles

Authors should submit text in the form of a disk accompanied by a printout wherever possible. Use of disks reduces the risk of introduction of errors during re-typing. It is helpful to give brief details of the computer, operating system and software package(s) used.

Deadlines for submission

Contact the Editor's office or the Administration office for submission dates. Late submissions will not be accepted or publication will be deferred to a later issue.

Illustrations

Authors are encouraged to submit diagrams, drawings, photographs or other artwork to illustrate their articles or, if they cannot provide these themselves, to suggest what artwork might be appropriate. Photographs may be colour or black & white, prints or transparencies.

Author photographs

The Magazine normally includes photographs of the authors of articles. These may be colour or black & white; prints are preferable if cropping is required.

References

Authors are requested to keep the number of references to a minimum (preferably no more than two or three), in the style of the Journal of Physiology.

Suggestions for articles

These should be made either to the Editor, to the Magazine Co-ordinator or to a member of the Magazine Editorial Group (see below).

Magazine Online

The magazine is now available on our website.

Magazine Editorial Group

WELCOME TO THE UNIVERSITY OF BRISTOL

PHYSIOLOGY AT BRISTOL

The Department is delighted to welcome the Physiological and British Pharmacological Societies to a joint meeting in Bristol in September. The last meetings of the Physiological Society at Bristol were in 1994 and 1997, at which times descriptions were provided in the magazine (no 12, Spring 1994, by David Armstrong, and no 28, Autumn 1997, by Stephen Lisney). The only properly joint – and highly successful – meeting that the Physiological Society has held with the BPS was in Southampton in September 1998.

The Bristol meeting promises to be a large and exciting one, spread over 4 days and with 6 symposia – 3 with a physiological bias and 3 with a pharmacological bias (details in the Sheffield meeting programme). Despite the proximity of the IUPS meeting in Auckland, we hope for a good turnout of physiologists as well as pharmacologists; the scientific programme should warrant it, and Bristol has much to offer (including a reception at the new Explore@bristol venue).

Since the 1997 Society meeting in Bristol, major changes have taken place to our staff and to the infrastructure. A summary of these, and of our current research, follows.

The Department and its Staff

We are a moderate sized department; altogether we number about 110, of which 17 are currently permanent academic staff. The annual budget is currently about £4.4M, of which almost half is in the form of research grants. Administratively, the Department is one of 5 making up the School of Medical Sciences, which in turn is one of 4 Schools in the Faculty of Medicine (the others being the clinical schools of Medicine, Dentistry and Veterinary Science). Our BSc teaching falls administratively under the Faculty of Science. We are housed in 3 buildings – the School of Medical Sciences, in the adjoining Medical Science Teaching Laboratories (see below) and in the School of Preclinical Veterinary Science in Southwell Street, 5 minutes walk away.

Sergey Kasparov

Matthew Holley preparing for the frozen north

Just before the last meeting of the Society here in 1997, Roger Thomas moved to Cambridge, Jonathan Ashmore left for UCL, and Reg Chapman sadly died. Since then, Brian Bush, Don Lewis and John Luck have all reached normal retirement age, Allan Levi left the sector on ill-health grounds, Corné Kros recently returned to Sussex, and Matthew Holley is just in the process of moving to Sheffield; all contributed vigorously to the Department, and we thank them and wish them well for the future. In 1997 Stephen Lisney, then Head of Department, took over as Chairman of Medical Sciences, to be replaced by Max Headley. This session Stephen has taken on the full-time post of Dean of the Faculty of Medicine.

Losing half one's staff complement over 5 years is both a challenge and an opportunity. The Department is delighted to have been able to make recent external appointments of Lucy Donaldson from Leicester, David Sheppard from Edinburgh, and Andy James from GKT. We are also pleased to have been able to appoint some of our excellent independently-funded fellows. Richard Apps, Jules Hancox and Julian Paton

retain proleptic status until the end of their current fellowships, while Frankie Semenenko and Sergey Kasparov took up permanent lectureships, and Dilwyn Marple-Horvat a temporary one. We have also welcomed back Graham Mitchell from Witwatersrand in South Africa, this time on a more extended visiting professorship, and Gerald Offer who moved from the Department of Clinical Veterinary Studies to work more closely with the molecular motility group (see below).

For many years the Department has been extremely short of space and modern facilities. Happily that situation has recently changed dramatically. The move of Synthetic Chemistry to a purpose-designed building in 1999 allowed

David Sheppard and Zhiwei Cai

Medical Sciences to take over most of one wing of the Chemistry building immediately adjacent to the School of Medical Sciences, and, with £5M HEFCE funding, convert it into a suite now called the Medical Science Teaching Laboratories. Physiology has gained new 'wet' physiology and 'dry' histology teaching laboratories large enough for the imminent expanded intakes of students (vets to 100 in 2001, and medics to 230 in 2002). This development in turn freed up a column of 4 old teaching laboratories in the School of Medical Sciences building, on 3 floors adjacent to current Physiology space (and including the labs previously used for Society meetings). With a £9M Wellcome JIF award, this column (with the addition of another floor) is at the time of writing about to be commissioned as the Henry Wellcome Laboratories for Integrated Cell Signalling. During June/July Physiology will take over some 300m^2 of new space and almost as much again of refurbished space. On

Bridget Lumb

top of that development, the University has just committed some £3M of its SRIF funding to improve animal accommodation, and other SRIF investments will strengthen molecular facilities from which we shall also benefit. All of these investments have caused – and continue to cause – enormous work and disruption to staff, but we are confident that the end results will be worth the trouble.

Teaching

As implied from the above, the Department teaches medical (current intake 170), dental (55), veterinary (85) and BSc (20 Honours Physiological Science plus subsidiary) students. We were pleased (thanks largely to Judy Harris' efforts) to get a 24 in our own Subject Review (though rather less pleased at the time and energy expended in achieving it, as well as in contributing heavily to the 3 'clinical' reviews). On the BSc front, for 2000-01 we have restructured our final year to permit parallel

Julian Paton with Pedro Boscan and Julia Smith from St Georges

Physiological Science and Neuroscience BSc programmes; the latter is a new development for us, introduced in close collaboration with the Department of Anatomy so as to provide both greater student choice and to improve the

efficiency of teaching (by sharing procedures and some teaching with the Anatomical Science and Equine Science programmes that Anatomy runs). Implementing such change is again time consuming (primarily in this case for David Armstrong and Bridget Lumb) but we feel that our BSc programmes are greatly improved.

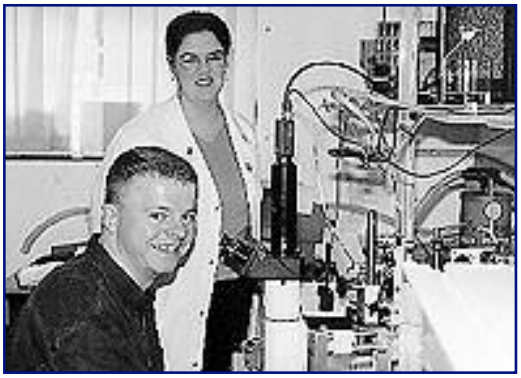
Research

The Department has had a strong record in research ever since Arthur Buller revitalised the Department in the mid sixties. We have had RAE 5A ratings in the last two exercises, and hope for a repeat of that later this year. Our steadily increasing external funding comes mainly from Wellcome, BHF, MRC and BBSRC.

The staff changes over the last 5 years have inevitably affected the balance of our research. In particular the new expertise has allowed us to increase our molecular skills, with a view to combining the best of molecular approaches with the systems physiology skills that we are very pleased to have managed to maintain. We now consider ourselves grouped into 4 main research areas:

Cardiovascular and respiratory function

Jules Hancox and Andy James (and formerly Allan Levi) work on the ion channels underlying cardiac myocyte rhythmicity and contractility, and Bob Meech, too, contributes to this work. Phil Langton works on the mechanisms of microvascular smooth muscle relaxation. Dave Bates moved here in 1999 to develop his multidisciplinary approach to angiogenesis. Julian Paton continues to use his highly successful perfused 'working heart brainstem' preparation in the mouse and rat that underlies his



Dave Bates and Catherine Powell

Phil Langton enjoying the prospect of actually doing an experiment

and Sergey Kasparov's combined electrophysiology, confocal imaging and viral transfection analysis of the cardiorespiratory functions of the nucleus tractus solitarius (NTS). Graham Mitchell brings expertise in measurement of cerebral blood flow in unrestrained animals. David Sheppard combines mutagenesis and electrophysiological approaches to investigate the Cystic Fibrosis Transmembrane

Sally Lawson

Regulator (CFTR) chloride channel.

Sensory transduction and sensory neurones

Sally Lawson continues her detailed characterisation of the chemical phenotypes and ion channel expression in dorsal root ganglion sensory neurones. Bruce Matthews has an ongoing study into the role of dentinal tubules in sensory transduction in teeth, and the properties of the nerve fibres that supply teeth. Matthew Holley has been using his novel immortalised cell lines from the cochlea to define mediators of cochlear differentiation that underlie the onset of sound transduction. Before he left, Corné Kros worked on the K^+ channel properties of normal and mutant hair cells during cochlear development. Bob Meech has become more

involved with the hair cell work, and Helen Kennedy is using confocal microscopy to image subcellular calcium in these cells. Nigel Cooper has developed a novel laser vibrometer to make detailed *in vivo* measurements of basilar membrane responses to sound stimuli.

Integrated CNS functions

Somatosensory processing is a strong theme. Lucy Donaldson is investigating why periodontal (unlike other) inflammation is not painful, and also studies the contralateral spread of arthritis. Max Headley (if not incarcerated in the HoD office) tries to work on glutamate receptor roles in spinal nociceptive processing and, with Julian

Lucy Donaldson demonstrating modern physiology

Paton, on the relationships between spinal somatic nociceptive and sympathetic mechanisms. At a supraspinal level, Bridget Lumb and Frankie Semenenko study the hypothalamo-midbrain-spinal cord circuitry underlying behavioural responses to pain and stress, and Julian Paton has defined roles for the NTS in cardiac pain. At a cortical level, Roland Jones is studying presynaptic NMDA receptor function and the properties and distribution of GABA interneurones that may underlie epileptogenesis and antiepileptic drug action; he is a member of the recently-created MRC Centre in Synaptic Plasticity. Sarah Wood (previously a temporary lecturer here) will shortly return to work with Roland.

David Armstrong, Richard Apps, Judy Harris and Dilwyn Marple-Horvat (the Motor Control Group) are concerned with the supraspinal control of movement and the cellular organisation of the cerebellum. They combine anatomical tracing with electrophysiological

K.W. Ranatunga and Gabriel Mutungi

studies in awake animals, to determine mechanisms of motor control and the sensory inputs that modulate it. Increasing emphasis is being given to the link between visual saccades and motor coordination.

Molecular mechanisms of motility

The group has common interests in cross-bridge cycling of motor proteins that produce tension and movement. K.W. Ranatunga works on contractile activation and force generation in skeletal muscle, and with Gabriel Mutungi studies the relative roles of active and passive (viscoelastic) forces. Tony Ridge continues to characterise the neonatal development of neuromuscular connectivity, and Sarah Wood, before changing her emphasis to CNS synapses, worked on ACh receptors at the neuromuscular junction. David Woolley uses rapid cryofixation and electron microscopy to resolve the conformations of dynein arms during flagellar motion. Gerald Offer uses molecular modelling and has proposed a new model of the arrangement and temperature dependence of myosin heads in muscle thick filaments.

We hope that you will come to the Bristol meeting to see all the changes that have taken place, to share our scientific interests with us, and to enjoy the meeting!

Max Headley

Head of Department of Physiology
University of Bristol

NON-EXCITABLE CELL CALCIUM ENTRY – STATUS REPORT

Austin Elliott reports that, despite intensive research, there are still competing theories on how calcium entry in non-excitable cells is controlled

"Stimulation of phospholipase C-coupled receptors in non-excitable cells causes an increase in intracellular free calcium ($[Ca^{2+}]_i$) consisting of two phases. The first phase is release of Ca^{2+} from intracellular stores, triggered by inositol 1,4,5-trisphosphate (IP_3) acting on IP_3 receptors (IP_3Rs) on the ER, while the second phase is Ca^{2+} entry from the extracellular space".

So far so good, and nowadays well-known Physiology undergraduate course material. Behind it, however, lies an interesting historical paradox. The importance of Ca^{2+} entry in controlling responses in cells other than muscles and nerves was actually recognised as long ago as the early 1960s (see Petersen, 1980, for some historical background), pre-dating the discovery of the Ca^{2+}-releasing actions of inositol phosphates in 1983 by two decades. Another twenty years on, we now know rather a lot about how intracellular stores release Ca^{2+} (see review by Berridge, 1999). In contrast, the precise nature of the Ca^{2+} entry pathway, and the mechanism or mechanisms by which it is activated, continues to tantalise – and elude – researchers. Most work has concentrated on so-called store-operated or "capacitative" Ca^{2+} entry, in which the depletion of the intracellular stores somehow activates Ca^{2+} influx (Parekh & Penner, 1997). The question remains precisely how store depletion does this. A further complication is that there is still some debate as to whether this capacitative Ca^{2+} entry is the major, or indeed the physiological, pathway for stimulation-evoked Ca^{2+} influx.

What is the molecular identity of the Ca^{2+} entry channel?

So far the ion channel mediating depletion-activated Ca^{2+} entry has not been conclusively identified, despite considerable efforts. For most

What's in a name?

Non-excitable cell Ca^{2+} entry has been given a confusing variety of names, including store-operated, intracellular messenger-activated, and so on. This largely reflects our lack of precise knowledge about the mechanism of activation of the Ca^{2+} entry pathway. The term "capacitative" Ca^{2+} entry, coined by Putney in an influential 1986 review (Putney, 1986), is still widely used. Putney summarised evidence from a number of labs, including his own, indicating that depletion of intracellular stores *per se* was enough to trigger Ca^{2+} entry (Figure 1). The continued presence of agonist bound to the receptor was not required, and thus (presumably) nor was IP_3 metabolism. This activation of Ca^{2+} entry simply by depletion of stored Ca^{2+} resembles the action of an electrical capacitor, hence "capacitative". However, "store-operated" or "depletion-activated" is now often preferred.

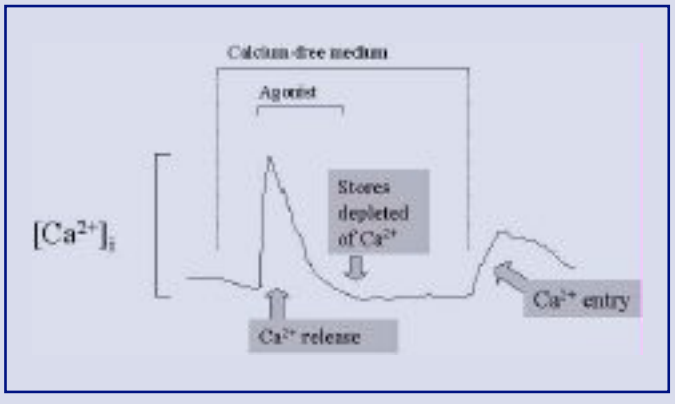


Figure 1. *Experimental demonstration of depletion-activated Ca^{2+} entry (see Putney, 1986). Re-addition of extracellular Ca^{2+} produces an increase in $[Ca^{2+}]_i$ due to Ca^{2+} entry even though the agonist has been removed some time before.*

of the last decade homologues of a *Drosophila* protein, TRP, have been considered the most likely (only?) candidates. The *trp* gene was originally identified because mutations in the gene caused *Drosophila* photoreceptor cells to have grossly abnormal receptor potentials. On exposure to light, the photoreceptors from the mutant fly showed only a transient, rather than the normal sustained, depolarisation, since the Ca^{2+} entry that drives the sustained depolarisation was absent (for more details and references see Harteneck *et al*, 2000). Subsequently a family of mammalian TRPs have been identified and studied extensively in expression systems (Harteneck *et al*, 2000; Hofmann *et al*, 2000). Although it seems clear that over-expression of at least some of the TRP proteins can augment depletion-activated Ca^{2+} influx, none of the TRP work has shown convincingly that any TRP protein is the long-sought channel (Hofmann *et al*, 2000). Indeed, a paper published earlier this year in *Nature* argues that a different, though distantly related, Ca^{2+} channel protein, called CaT1, is the capacitative entry channel (Yue *et al*, 2001). The TRPs and CaT1 both share a number of structural features with other cation channel families, including *Shaker*-like voltage-dependent K^+ channels (Figure 2). Many researchers working on TRPs believe that the TRPs may be components of multimeric Ca^{2+} channels, with different family members, and possibly other regulatory proteins, coming together to give a range of subtly different depletion- or messenger-gated channels. Similar logic will presumably apply to CaT1 and its homologues.

A family of depletion-activated Ca^{2+} entry channels might explain the fact that depletion-activated Ca^{2+} entry does not have identical properties in all cells, with differences being observed in cation selectivity/permeability (e.g. permeability to Mn^{2+} ions) and sometimes in sensitivity to blockers (for reviews see Parekh & Penner, 1997; Clementi & Meldolesi, 1996). The blockers most commonly used are divalent and trivalent metal cations such as Ni^{2+} and La^{3+}. This highlights the important point that there is still no selective organic blocker of depletion-activated Ca^{2+} entry (for review see Clementi & Meldolesi, 1996). Given the importance of depletion-activated Ca^{2+} entry in regulating cellular functions (see below), selective inhibitors of the pathway could be expected to have many applications in medicine.

Who needs Ca^{2+} entry anyway?

Although the arguments continue over how Ca^{2+} enters non-excitable cells, there is no argument about the functional importance of Ca^{2+} entry. The essential role of TRP in *Drosophila* phototransduction provides one obvious example, but there are many others. In one intriguing study, Lewis and Crabtree used a clever genetic selection strategy to generate mutant lymphoma cells with defective depletion-activated Ca^{2+} entry. The mutant cells with impaired Ca^{2+} entry were unable to activate interleukin gene transcription properly in response to antigen presentation (Fanger *et al*, 1995). Many other responses in non-excitable cells which are driven by changes in $[Ca^{2+}]_i$ are also inhibited by blocking Ca^{2+} influx. It should be noted, though, that this is not a rule – in

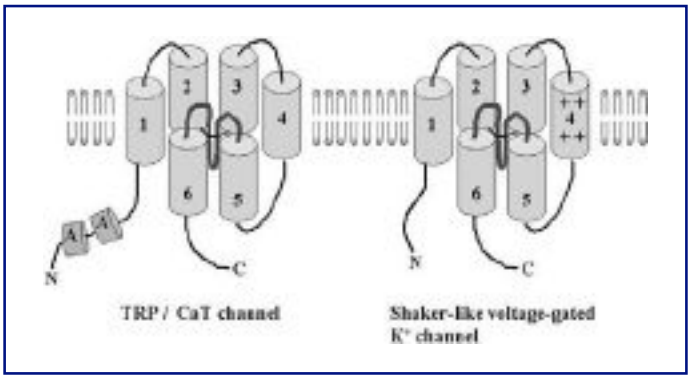


Figure 2. *Predicted membrane topology of a TRP/CaT channel (left) and of a different member of the six-transmembrane spanning cation channel superfamily, a* Shaker*-related voltage-gated K^+ channel (right). The extracellular loop between the helices 5 and 6 is thought to be important in formation of the channel pore. Channels of the TRP and CaT families have up to three ankyrin-binding (cytoskeletal interaction) domains (A) in their intracellular N-termini.* Shaker*-like K^+ channels have several positively charged residues in the 4th trans-membrane helix, which are thought to confer voltage-dependent gating. Other members of the superfamily are hyperpolarisation-activated cyclic nucleotide-gated (HCN) cation channels, and cyclic nucleotide-gated cation (CNG) channels, both of which have cyclic nucleotide binding domains in their intracellular C termini. For further details see Harteneck* et al, *2000.*

some non-excitable cells the release of stored Ca^{2+} alone is enough to produce a full functional response. Indeed, in some non-excitable cells sustained Ca^{2+} entry may actually be associated with cell death (Raraty *et al*, 2000).

What triggers Ca^{2+} entry following store depletion?

There are two main theories as to how store depletion activates capacitative Ca^{2+} entry. The first theory suggests that store depletion produces a low molecular weight soluble messenger which diffuses to the plasma membrane to open the channels (Figure 3A). A wide range of candidates for this "Calcium Influx Factor" (CIF) have been suggested (for a comprehensive review of the earlier literature see the review by Barritt, 1999). None has stood the test of experiments in all systems, although work continues, with a recent paper arguing that a similar, though as yet unidentfied, molecule serves this function in yeast and in mammalian cells (Csutora *et al*, 1999). The second theory, which has gained ground as various candidate "CIFs" have been discredited, suggests that the IP_3R itself interacts physically with the Ca^{2+} channel to trigger channel opening. This theory, originally proposed by Irvine (Irvine, 1990) and subsequently championed by him and by Berridge, obviously requires the Ca^{2+} stores to be within a few nanometres of the plasma membrane. This so-called "conformational coupling" model has received strong support from several key articles in the last two years (see Elliott, 2001). In particular, Muallem's lab has demonstrated a direct interaction between Ca^{2+} entry channels and IP_3Rs (or protein fragments of IP_3Rs) in isolated patches, while evidence from several other labs highlights the role of the cytoskeleton in maintaining close contact between the Ca^{2+} stores and the channels. There are also studies that suggest that vesicle insertion into the membrane may be involved in the activation of Ca^{2+} entry (Figure 3B). More extensive discussion of this area, and references to the original articles, can be found in several recent reviews (Elliott, 2001; Putney, 1999; Rosado & Sage, 2000).

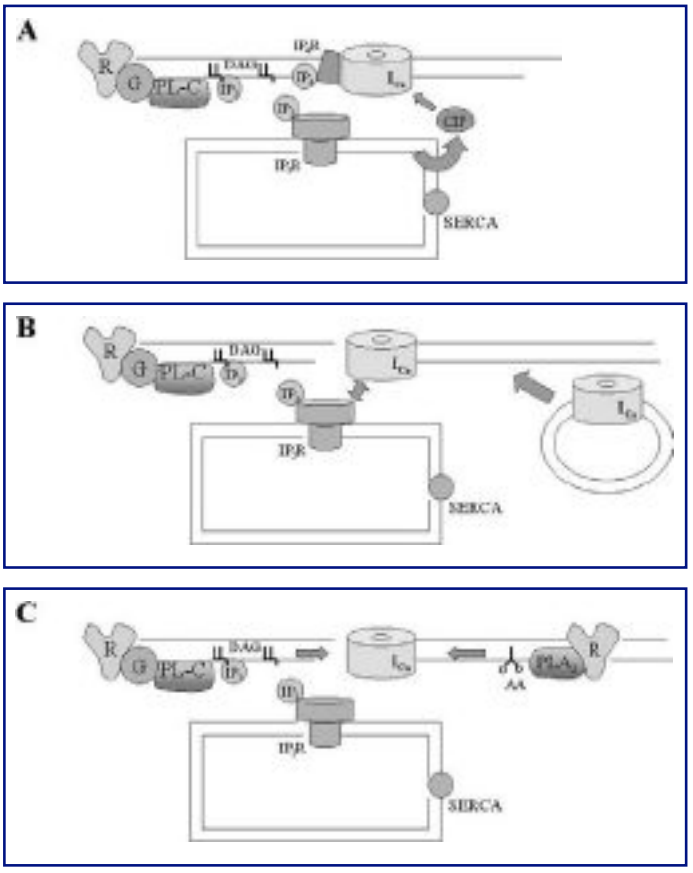


Figure 3. *Current models proposed for regulation of agonist-dependent Ca^{2+} influx in non-excitable cells.* **A**: *activation by a soluble messenger produced by depleted intracellular Ca^{2+} stores (termed "CIF" for "calcium influx factor"). Some workers have also suggested that inositol 1,3,4,5-tetrakisphosphate (IP_4), generated by phosphorylation of IP_3, may regulate Ca^{2+} influx via a membrane–localised IP_4 receptor.* **B**: *activation of Ca^{2+} entry by direct interaction of Ca^{2+} channels and IP_3Rs ("conformational coupling"), or by vesicle insertion. Both these mechanisms postulate a physical interaction between the plasma membrane and intracellular stores.* **C**: *"Non-capacitative" Ca^{2+} entry. Here Ca^{2+} channels are proposed to be activated by a membrane-delimited lipid messenger, which might be diacylglycerol or arachidonate. For detailed discussion of all these mechanisms see Elliott, 2001.*

Is stimulation-activated Ca^{2+} entry necessarily capacitative?

Finally, there remains the possibility that capacitative Ca^{2+} entry may not represent the only, or even the critical, route for agonist-activated Ca^{2+} entry. For instance, there is good evidence that the closely related TRPs 3, 6 and 7

form a distinct subfamily of TRP channels which can be directly activated by diacylglycerol (Hofmann *et al*, 2000). These channels would therefore be activated following receptor stimulation but *independent* of store depletion. There is also evidence for non-capacitative Ca^{2+} entry activated by arachidonic acid, which is formed on stimulation of cells by activation of Phospholipase A_2 (see Elliott, 2001 for refs). Shuttleworth has even argued that this arachidonate-activated non-capacitative pathway may be the dominant route of Ca^{2+} entry under physiological conditions (Shuttleworth, 1999).

Summary

Despite intensive research, there is no true consensus on the molecular identity, or regulation, of the depletion-activated Ca^{2+} entry pathway. Hopefully, further expression and cloning studies will confirm whether CaT1, TRP, or some other channel protein is the actual molecule underlying depletion-activated entry. In terms of regulation, conformational coupling models are currently in the ascendant over "CIF" theories, although the evidence for soluble messengers in some systems continues to accumulate. Finally, there remains lingering suspicion that depletion-activated entry may not necessarily be the physiological route for stimulation-evoked Ca^{2+} entry in many cells. Progress in all these areas can be expected as the study of non-excitable cell Ca^{2+} entry continues "beyond 2000".

Austin Elliott

University of Manchester
School of Biological Sciences
G38 Stepford Building
Oxford Road
Manchester M13 9PT

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ANIMAL RESEARCH – HARD PILL TO SWALLOW

Adapted from 'Animal research: hard pill to swallow', by Bill Parry. First published in Biobits, May 2001. Copyright Institute of Biology.

Nothing is more conducive to bringing an issue to the fore than a crisis. The near closure of Huntingdon Life Sciences (HLS) by animal rights activists and an alarming rise in violent attacks by extremists have led researchers and the lucrative UK pharmaceutical industry to reconsider their futures here. In turn, society and the government have been forced to address this thorny issue before more harm is caused, and to engage in debate rather than skirt it.

Professor Colin Blakemore FRS

For 14 years, Colin Blakemore, Waynflete Professor of Physiology at Oxford University, has campaigned to promote open, frank and constructive debate on the issue. In addition to his individual efforts, he co-founded the Boyd Group, which provides 'a forum for the open exchange of views on issues of concern related to the use of animals in research.' While such efforts have been supported by many (often tacitly), he, his family and colleagues have suffered the gamut of threats, abuse and attacks by animal rights activists.

I spoke to him at his office in Oxford, a room wallpapered to the ceiling with books concerning such things as the mind, brain, cognition, cloning and, somewhat surprisingly, St Augustine. I asked him about licensing procedures for animal experimentation, the government's changing approach to the issue, and public perception and acceptance of this emotive and volatile issue. And, to confirm my suspicions, why the office doors throughout the building have just numbers, no names.

Licensing system

Britain has the most stringent animal research laws of any country, regulated and enforced by the Home Office. Gaining approval for a new Project Licence (and even for amendment of an existing Licence) is now a notoriously lengthy process and can result in significant delays relative to other countries: typically a few weeks in the United States and elsewhere in Europe, but six months or more in Britain. Do the licensing laws have his support? In spirit, absolutely. Blakemore feels they symbolise Britain's commitment to high standards and that they promote the three Rs of animal use: replacement, reduction and refinement. However, he says 'implementation is the problem; it has become incredibly bureaucratised,' adding: 'It is very difficult to compete scientifically when it takes so long to get permission.'

Part of the reason for delays, he says, is a shortage of Inspectors at the Home Office: not enough to review the licence applications efficiently, and not enough to inspect the facilities and monitor animal experiments adequately. This should soon see an improvement, as the Home Office announced on 22 March plans to increase the Inspectorate by 50% over the next three years. The introduction of an additional hurdle in the application procedure, namely the local Ethical Review Process (ERP), has also undoubtedly contributed to delays. Blakemore hopes and expects that the review of ERP, now being undertaken by the Home Office, might lead to streamlining of the procedure.

New Labour

However, some of the delays were political, Blakemore feels. During its first two years in office, Labour endorsed and pursued policies sympathetic to animal welfare and rights organisations. Animal welfare groups, which had donated £2.1 million to the Labour party, believed and expected that radical legislative changes were imminent. Labour quickly realised, however, that certain policies were untenable, such as a Royal Commission on animal experimentation, which had been proposed in a

pre-Manifesto document. There now seems to be rather general agreement that such a lengthy and costly exercise is not justified only a decade or so after the introduction of the Animal (Scientific Procedures) Act 1986. The number of animals used in scientific procedures, which had steadily declined by 50% over the previous two decades, actually saw a small rise in Labour's first two years in office. Although this was clearly due to a rapid expansion in the use of transgenic animals, which can provide remarkably effective models of human disease, the rise in animal use tarnished Labour's 'animal-friendly' image. Blakemore wonders whether the increasing delays in processing Licence applications might initially have been welcomed by the government, since it gave the impression of a tougher approach to licensing, and, conveniently, to counter the rise in animal use.

Newer Labour

Blakemore notes a considerable, positive change in Labour's policies over the last eight months. He comments: 'Labour realised that their loose pre-election pledges and initial stance may actually have stimulated a rise in terrorism and activism, by raising false expectations.' He also speaks optimistically and supportively of Lord Sainsbury's recognition of the scientific community's concerns, which Sainsbury has committed the government to addressing and resolving.

But are Labour's changes too late, as many argue, particularly in the light of recent events at HLS? Labour's response has sent a clear, albeit belated, message of its support and commitment to researchers and the industry. Blakemore is, however, convinced that significant damage has already been caused: 'It is hard to imagine that a major drug company would set up a new research facility in this country because of the present climate and lack of support in the past from government.' He adds: 'I think if HLS goes down, there will be a migration of drug companies out of Britain.'

To put the consequences of such a migration into perspective, some figures: the UK pharmaceutical industry provides £7 million of research investment per day, according to the Association of the British Pharmaceutical Industry (ABPI). The industry employs some 60,000 people, 15,000 of whom are highly skilled scientists, and employs another 250,000 in service industries. It earns £2 billion a year for the UK economy in its balance of trade. According to Blakemore, its level of reinvestment in research and development is proportionately higher than any other industry in the UK, and its contribution to the economy is huge.

Criminal Justice & Police Bill

Labour is now attempting to curb animal rights extremism in a number of ways, including the addition of critical amendments to the Criminal Justice and Police Bill, which was rushed through before the end of the parliamentary session. Blakemore welcomes the proposed changes to this, particularly now that it will clearly help to protect academic staff as well as individuals working for commercial organisations. He speaks enthusiastically of a meeting with Jack Straw, who conveyed Tony Blair's personal commitment to oppose extremism.

But does he feel that the proposed changes to the law are sufficient? 'It depends on how animal rights activists and the courts respond to the new law. I have no doubt that the activists will try to challenge it,' he says. If there is a continuing series of large, well-organised demonstrations involving scores of protestors at different locations around the country, he imagines 'it would be difficult for the police to implement the law.' Much will depend on the attitudes of the courts: 'In the end it's up to a magistrate or a judge to decide if someone is guilty; I think we'll see a battle in the courts, with this issue represented as a challenge to the freedom of speech.'

This issue of 'freedom of speech' touches a nerve in Blakemore: 'I like to think that I am, by nature, a libertarian and I wouldn't want to interfere with anyone's freedom of speech. On the other hand, I've suffered at the receiving end of terrible harassment. It's a disgusting tactic, clearly aimed at depriving me and other scientists of our

freedoms of expression. I can't imagine any circumstances, at least in a proper democracy, in which it's a necessary part of personal freedom to allow protestors to express their views so forcefully outside the home of someone *they* have decided to target. A single-issue group or terrorist group, in choosing to target an individual in this way, is taking the law into their own hands, acting as judge, jury and executioner, and meting out their punishment not only on their chosen victim but also on his or her family and neighbours. That contradicts the whole process of the democratic rule of law, and deprives the victim of the basic right to a fair hearing. I can't see that it's an essential part of freedom of speech. There are always other ways and other places to protest.'

Changing Public Opinion

A shift in public opinion, Blakemore says, is imperative – and there are positive signs of this. When asked the simple question, 'Should scientists be allowed to use animals in research?' a majority of the public are opposed. However, when informed that such research is required to understand diseases and to create safe treatments, a majority support it. To him this proves that people are perfectly able to perform a quite sophisticated cost-benefit analysis – if they have the facts. He cites the fact that public support for animal research actually increased during the intense media coverage of the attack on HLS, despite 'the very frank presentation about the role of animals.' This shows, he says, that 'the public are willing to listen to things that they don't really want to hear, and to weigh benefits against costs. We shouldn't under-estimate their capacity to understand what is done and why it has to be done.'

Part of the problem in shifting public opinion, however, is in making information readily available. In preparation for this interview with Blakemore, I spent many hours searching for material from various websites and had to try to determine its validity and veracity. Should the public have to seek out reliable information, or should such information find them? Animal rights activists, in contrast, are extremely effective in promoting their views either via media coverage or on the High Street.

Blakemore identifies five groups that could and should work to promote awareness and inform public opinion: scientists, drug companies, the government, the medical profession and the media. 'Scientists must be much more willing to talk about what they do,' he says. 'When we describe our research, we shouldn't hide the fact that animals are involved. We should be absolutely up-front.' The veil of secrecy surrounding their work has given rise to the 'notion that researchers are eccentric boffins doing horrid things to animals behind locked doors,' he says.

Drug companies, he feels, should shoulder more responsibility in the debate, for two main reasons: they are increasingly a target of activists, and they have the money to do so.

In addition to implementing and enacting laws, the government should ensure that school pupils are better informed about the uses of animals, including in research. 'Schools are crucial,' says Blakemore. 'The National Curriculum should include more explicit topics on the use of animals, with good coverage of scientific and medical arguments, as well as the moral objections, so that every kid will think about the issue, write essays about it, debate it.'

Ninety-five percent of medical doctors support the continuation of animal research, and they could play a crucial role in informing the public about it. Blakemore says they should feel an obligation to do so, since their training and the medications they prescribe are dependent on animal research. In addition, he says, 'the public still trust doctors more than they trust scientists, the media or politicians.' Yet the majority of doctors are reluctant to voice their support openly, like many, for fear of the potential reprisals by activists.

Blakemore proposes 'a disclaimer at the bottom of every prescription, stating: "The treatment you are receiving was developed through the use of animals and was safety-tested on animals." In this way people would be reminded of the necessary role animal testing plays in developing medicines, and would see a direct, personal benefit.

He believes that the media ought to take a more serious approach, 'not just presenting the animal issue in sentimental or sensational terms, but discussing it frankly and dispassionately when they report medical breakthroughs.' The public should be told how those benefits were arrived at.

Food for thought

The current Foot and Mouth crisis presented the UK with horrific images of carcasses piled high awaiting disposal and of pyres illuminating the night sky. As this article goes to press, some 1600 confirmed cases have accounted for the slaughter of over 2.8 million healthy but potentially infected cattle, sheep, pigs and goats, according to MAFF, all in order to eradicate the virus – and, more importantly, to restore exports. We are appalled by the carnage and the wasted life and revenue, but generally accept it as a necessary evil. Surprisingly, animal welfare groups have been generally quiet on this issue.

The number seems large, but to put it into perspective, we slaughter some 700 million animals a year for food. By comparison, we use about 2.6 million animals in lab research, 83.1% of which are mice and rats (in contrast, cats, dogs and primates combined accounted for 0.6%, according to data published by the ABPI [1999 statistics]). In addition, for every rat used in scientific research, we exterminate 10 as pests. It seems odd that scientific researchers and pharmaceutical companies, working to improve our lives, should be the primary target of animal welfare groups when a vastly greater number of animals, subject to less stringent welfare control laws, are reared for human consumption. Blakemore agrees: 'The total number of animals used in the UK translates to just over two rodents per person per lifetime as your total contribution to the improvement in human health. How does that compare with the number of chickens you eat each week? When you consider all the ways in which people use animals, from hunting them and eating them, to wearing bits of them, using them to advance science and to cure disease seems just about the most noble use. And yet it provokes the most vociferous criticism.'

Colin Blakemore speaks passionately and openly about his views. Despite the appalling violence and intimidation he and his family have endured – and still endure – his continued commitment to addressing the issue, to raising awareness and to soliciting constructive dialogue with all sides in the debate must be respected, whatever your views on animal testing. Only through such openness, free of threats and violence, can suspicion be eroded, understanding and consensus reached, and common goals identified and realised.

Bill Parry

Institute of Biology
20 Queensberry Place
London SW7 2OZ

Links:

www.boyd-group.demon.co.uk

The Boyd Group: In addition to information about the Group and its policies, ethos and work, there are links to animal welfare organisations; anti-vivisection societies; bodies that fund or are directly engaged in research involving animals; legislation; scientific societies and professional associations; philosophical resources; and veterinary organisations.

www.abpi.org.uk

The Association of the British Pharmaceutical Industry: the trade association for about 100 companies in the UK producing prescription medicines.

www.rds-online.org.uk

The Research Defence Society is the leading organisation in the UK which represents scientists in the public and political debate about the use of animals in medical research.

www.bret.org.uk

The Biomedical Research Education Trust is a charity that provides secondary schools with speakers and educational materials about the humane and responsible use of animals in medical research.

HOUSE OF LORDS CALL FOR EVIDENCE ON THE USE OF ANIMALS IN SCIENTIFIC PROCEDURES

A Select Committee has been set up to look at this issue. I notified the membership of the invitation extended to The Society for evidence and would like to thank those Members who contributed. The following letter was based around those responses, with input from the Animal Welfare and Legislation Sub-Committee and the main Committee of the Society. Invitations to give oral evidence will be tendered in September to a selection of those submitting written evidence, or to other relevant bodies. If The Society is invited (either alone or as part of the UKLSC) then a report will appear in the next issue of *The Magazine*, and also on the website. The response from the UKLSC is available on their website (www.uklsc.org).

Maggie Leggett

Select Committee on Animals in Scientific Procedures
Committee Office
House of Lords
London SW1A 0PW

31 May 2001

Dear Sir/Madam,

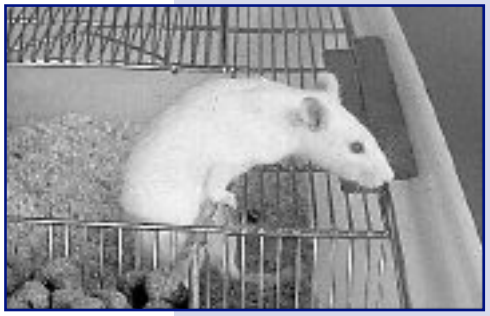
ANIMALS IN SCIENTIFIC PROCEDURES CALL FOR EVIDENCE

The Physiological Society is a Learned Society with a membership of approximately 1900. The majority of our members are academics working in Universities or Industry and many are involved in animal experimentation as part of their research. We have consulted with a cross-section of our membership as represented by the Trustees, and would like to contribute to the evidence reviewed by the Select Committee for the House of Lords on animal procedures in medicine and education.

1 *What have been the strengths and weaknesses in the operation of the Animals (Scientific Procedures) Act since 1986; how do you consider that legislation on animal procedures needs to be changed?*

A strong legal framework is appreciated by researchers since this provides a structure in which the scientific knowledge and moral values can be defended in a democratic society. Although there are inconsistencies across the country in the implementation of the Act, we accept that these are being addressed. A major concern is that the increased bureaucracy has resulted in Home Office Inspectors spending less time in laboratories. Any alteration that would lead to their increased presence would be welcomed by academics, and we therefore welcome the current recruitment. In addition there are some areas in which slight alterations in the Act would lead to greater efficiency, and also there are some changes required to meet the changing face of biomedical science. Members of The Society welcome current initiatives aimed to reduce the time taken for license application, for instance in the granting of licenses to collaborators on short visits to UK laboratories. The following are suggestions for alterations which might be made in order to aid the smooth running of the Act and prepare for the future, whilst not in any way compromising animal welfare.

The first of these suggestions concerns the methods of killing allowed under Schedule 1 to the Act. Certain methods of killing animals require a Home Office Licence under the terms of the Act. However, if an animal is killed by a method described in Schedule 1 then no licence is required and the animal is not counted in the annual statistics reported to Parliament. It would be appropriate to review Schedule 1 with a view to expanding the permitted methods of killing the animals. The impact of this would be to report more accurately the number of animals that have been subject to procedures and not include animals that are merely killed by humane methods.



Increasing the cost of animal experimentation has various consequences. As legislation becomes more time consuming and the cost of using animals escalates, the number used for educational purposes reduces. In many Universities experiments involving the use of animals have disappeared from the curriculum. The result being that an already dwindling expertise in this country may soon disappear altogether. This will not only affect University research and the future UK science base, but will also greatly affect the Pharmaceutical Industry which already has problems filling vacancies requiring these skills. There are a variety of possible solutions to this problem, for instance removing the fee for personal licensees.

2 *What scientific developments and changes in public attitudes have occurred relevant to animal procedures since 1986; have researchers and regulators responded to such changes; and do you consider their response has been appropriate?*

Public opinion on this issue has been measured many times. The most recent MORI poll showed that the majority of people recognise the need and benefits of strictly controlled animal experimentation such as we have in Britain. However, the vociferous few misrepresent the opinions of the majority, and this has lead to a situation where scientists engaged in such work are concerned for their personal safety. This has largely resulted from the heavy attack that institutions such as Huntington Life Sciences have come under from the anti-vivisectionist lobby. We welcome initiatives already announced which will limit the illegal activities of anti-vivisectionists. In addition more frequent public messages of support from the government might allay the fears of scientists and lay people alike.

3 *What are the current effective alternatives to animal procedures; and what alternatives to animal procedures might be developed?*

There has been a huge shift in the number of biomedical researchers using “test tube” rather than live animal methods. This is largely because in vitro experiments can be conducted under more stringent and controlled conditions. However, all “test tube” work must eventually be tested against the whole animal response, where one can see an integrated effect as a result of very complex interactions. In addition, the number of scientists using computer models to predict the outcome of experiments has increased dramatically. Whilst informative, any predictions from such work cannot be assumed to be true but must be verified in animals before being applied to humans.

The public demands early diagnosis, treatment and even preventative measures for diseases such as coronary heart disease, stroke and type 2 diabetes. We should not ignore these demands, on either ethical or practical grounds. At present, and for the foreseeable future, animal research is a necessary prerequisite for meeting these demands.

4 *How do you consider that demand for animal procedures will develop in the future; and how should the regulatory system respond?*

There are several new areas of research which will affect the number and type of procedures performed on animals. Perhaps the most noticeable increase will be in the number of transgenic animals, used for a variety of purposes. In addition there will be more research in the areas of cloning and xenotransplantation. Finally the post-genomic challenge may also result in an increase in animals used in procedures.

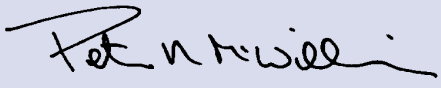
As the public expects the number of animals used in scientific procedures to decrease with the new genetics, any increase in numbers will be viewed with alarm. However, many transgenic animals are as healthy as wild types and procedures such as breeding do not, for these strains, in any way compromise animal welfare. Perhaps, once a strain which is phenotypically neutral has been established, the animals could be counted as mutants and excluded from the annual set of statistics reported to Parliament.

Conclusion

The principles behind the Act are welcomed by the scientific community, and the only frequently voiced complaint concerns the lengthy bureaucracy. The review of the Act is timely, coming at a point where scientific techniques are changing very quickly. The alterations suggested above may help to meet some of these changes, as well as slimming some costly and cumbersome procedures. In this country we can be proud of the effective legislation that protects animals used in scientific experiments. Lengthy delays in obtaining licenses have already driven some research overseas, where the conditions are less strictly controlled. We firmly believe that any move to further restrict animal experimentation in the UK will have a disastrous effect, not only on the economy and the science base, but also in the worldwide standard of care of laboratory animals.

The Society would be pleased to help in any further way possible in the House of Lords review, or on any other matters concerning animal experimentation. I hope that the comments above are useful and helpful.

Yours faithfully,



Professor Peter McWilliam

Chairman for the Animal Welfare and Legislation Sub-Committee

THE BIOSCIENCES FEDERATION – AN UPDATE

Despite its scientific excellence, there is concern that the UK biosciences community is failing to realise its full potential in matters of public affairs and communication generally. It is vital that the biosciences community should play a strong and effective role in matters of research and education policy and when wider scientific issues are debated in public and political arenas.

Much is being achieved already by individual learned societies and by coordinating groups. For some time now, the Society has been an active member of the UK Life Sciences Committee (UKLSC). We are represented on the Main Committee by Chris Fry, and take a full part in the work of the UKLSC Animal Sciences Committee and the Education Group. The UKLSC provides a forum for societies in the biosciences community to work together to further their aims. It has worked well, with joint responses to government consultation on matters to do with education, science policy and animal welfare issues as well as working together on careers events and the like. The belief is that the voice of one larger umbrella body carries more weight than many responses from smaller organisations as government in particular would prefer to consult with a single organisation representing the biosciences generally.

Over a period, there has been increasing talk of a Biosciences Federation to help us realise our full potential in influencing public policy.

Last November, the Institute of Biology, the UK National Committee for Microbiology, and the UKLSC set up a working group, tasked with drawing up proposals for a UK Biosciences Federation. Members were selected from the sponsoring bodies. The Society, as well as many others, put forward the names of a number of people prepared to take part in the working group. The Linnean Society, representing societies with a broad interest in biodiversity, and the British Ecological Society, representing those with ecological interests, joined the existing three sponsors. Together, the aim is to reflect the range and diversity of UK world-class biology and its Learned Societies.

Working Group Membership

The membership includes a representative of each of the five sponsors, together with several experienced biological scientists in an independent capacity. The full membership, with substitutes where chosen is:

Professor Sir John Arbuthnott
Co-Chairman (*Public Health Microbiology*)

Professor David Lewis
Co-Chairman (*Plant physiology/biochemistry*)

Professor Robert Freedman
UK Life Sciences Committee (*Biochemistry*)
[Substitute: Professor Martin Raff UKLSC (*Biochemistry*)]

Professor Rod Herbert
Chairman, UK National Committee for Microbiology (*Microbial ecology*)
[Substitute: Dr Steve Moss UKNCM (*Fungal Biology*)]

Professor Sir David Smith
President, Linnean Society (*Biodiversity Cluster*) (*Symbiology*)
[Substitute: John Marsden Linnean Society]

Professor Janet Sprent
Vice President British Ecological Society (*Ecological Cluster*) (*Plant/microbial nutrition*)
[Substitute: Professor John Whittaker President, BES (*Animal Ecology*)]

Dr Alan Malcolm
Chief Executive, Institute of Biology (*Biochemistry*)
[Substitute: Dr Lawrence Smaje Wellcome Trust (*Physiology*)]

Professor Sir Brian Follett
Independent (*Endocrinology/zoology*)

Professor Dame Anne McLaren
Independent (*Reproductive biology*)
[Substitute: Professor David Cove (*Plant developmental genetics*)]

Dr John Norris
Independent (*Industrial microbiology*)

Professor Chris Pollock
Independent (*Experimental plant science*)
[Substitute: Dr Helen Ougham (*Biochemistry of plant development*)

Lord Soulsby of Swaffam Prior
Independent (*Animal pathology*)

Dr Brian Jamieson
Secretary

Scope and terms of reference

The task of the Working Group is to draw up a strategy and a credible business plan for a federal organisation, including costs, sources of income and detailed structure, which will be the basis for securing sufficient support from the biosciences community to proceed. It is envisaged that the Biosciences Federation will be defined as a union for a common object of many biological Learned Societies, with each retaining control of its own internal affairs.

It will develop a vision and mission along the following lines:

Vision
The Forum and Voice of UK Biosciences

Mission
The UK Biosciences Federation is a partnership of Learned Societies united by their recognition of the centrality of biology in shaping the future of society. The Federation promotes, represents and supports the UK's world-class expertise in the Biosciences.

Method of Working

The main Working Group has set up Mini Groups to develop particular issues, notably what activities could be done more effectively at the level of a National Federation and how a Federation would relate to existing Societies and bodies. These Mini Groups will largely operate as small email networks to develop options and proposals.

Mini Group 1: Business Plan
(Chairmen: John Arbuthnott and David Lewis)
To prepare an outline business plan for the Biosciences Federation for an initial 3-year period.

Mini Group 2: Relationships with existing bodies
(Chairman: David Lewis)
To clarify the interfaces, responsibilities and working relationships between the Biosciences Federation and other bodies.

Mini Group 3: Curriculum development
(Chairman: John Arbuthnott)
To define a role for the Biosciences Federation in matters concerning secondary, undergraduate and postgraduate education and the careers of young scientists, including working methods for developing Federation policy and for influencing deliberations and decisions in this area.

Information and Consultation

The UKLSC is the conduit for information from the Federation Working Group to reach the Physiological Society. In addition, agenda and minutes of the Working Group's meetings will be posted at the Websites of the IOB and UKLSC (www.iob.org and www.lifesci.org respectively). Officers of the Society will be invited to a major event at the Royal Society on 8 October where the group will seek the reaction of Learned Societies to the proposals and options for a federal body.

What do you think?

Formal consultation with our membership will take place when full proposals are available, but in the meantime, do you have views on these proposals? Is a federal structure a good thing? Do you have any concerns about the way plans are developing? Put your views, by email to the Magazine Co-ordinator: sgreaves@physoc.org.

"WHO IS JACK STAT ANYWAY?"

Here's a question. Why can't scientists communicate with one another (let alone with the public) without a bucketload of meaningless abbreviations?

How many times have you sat in a seminar when you realise the speaker has just used, without defining it, an abbreviation you've never heard of? And you're lucky if it's just one. Usually there are a whole bunch of abbreviations together. They come in packs, like buses do when you've been waiting in the rain for half an hour.

I hate abbreviations. I hate everything about them. I hate reading them in papers. I hate having to look them up in the huge lists printed at the start of papers. I hate hearing them in seminars. Especially when I've just woken up and realise I've missed a full ten minutes-worth of choice abbreviations.

To add to the confusion, there are now so many abbreviations floating about in the biosciences that one finds the same, or almost the same, abbreviation meaning two completely different things.

An example: SOCS can stand for "Suppressor of Cytokine Signalling" or "Store-Operated Channels".

But of course, getting scientists to break off their love affair with abbreviations is a bit like asking a roomful of 40-a-day smokers to quit. We users have all kinds of reasons why we NEED our abbreviations. It saves space in the journals. It stops us having to repeat long incomprehensible phrases, which can now be replaced by long incomprehensible abbreviations. The abbreviations are a shared coded language, serving to identify "people like us" – the ones who can understand the abbreviations. And of course abbreviations are useful in social situations when we're talking to other scientists (i.e. people like us).

So despite the efforts of a few abbrevation-phobic journals – like the *British Journal of Pharmacology* – it seems unlikely that we will ever be able to kiss abbreviations goodbye. So I suppose I'll have to learn to love them. Which raises the question: do they have ANY redeeming features?

Well, once in a while. Mainly when they make you laugh. Because a really choice abbreviation can conjure up something entirely different from what the person who coined it intended.

For instance, an abbreviation may sound ugly – like the distinctly nasty-sounding ECAC ("E-cack"). Or illegal, like CRAC ("crack"). In fact there is a whole sub-family of abbreviations which could be confused with illegal substances, including ICE (interleukin-converting enzyme in scientific circles, a kind of amphetamine in parts of the USA) and JNK ("Junk", no explanation necessary, or *Jun* N-terminal kinase).

Personally, I blame the biochemists for all this abbreviation business. Seriously, the rot started when the first biochemist was allowed to get away with referring to a protein by an abbreviation referring to its molecular weight on a gel. Because now we're stuck with p53, p70, p120, p126 and innumerable others. Ever since that first p-something, biochemists have been the shock troops of abbreviation-ism. Biochemists LOVE abbreviations. And cell biologists are just as bad. Jak/Stat/Myc/Fos/Jun/Fyn. It sounds like a TV drama about flat-sharing young people with annoying nicknames. You can almost imagine the dialogue:

Hiya. Been out?

Yeah. Down the pub.

c-myc?

See Mick? Yeah - he's coming over about six for a beer

c-fos?

See Foz? That no-mark? We're not inviting him, are we?

What about Fyn?

Finn the Irish lad? Not likely, mate.

Nah. And we're not letting that #!! Jack Stat tag along either.*

Mark Cain

PHYSIOLOGISTS (AND BIOPHYSICISTS!)

Jorge Ponce-Hornos extends a Latin American welcome to Buenos Aires, where the XIVth International Biophysics Congress will take place from April 27 to May 2 2002.

Dear Colleagues,

Scientists from around the world will meet here in Buenos Aires for the 2002 Congress of the International Union for Pure and Applied Biophysics (IUPAB). It will be a tremendous pleasure for the Argentinian scientific community to welcome our colleagues from the biophysical sciences, including physiologists, to Buenos Aires. The purpose of this article is to give a bit of background about the traditions of Argentina in biological sciences, as well as about other things that might encourage you to make the trip to my country.

There is no doubt that biophysics and physiology have a lot in common. We members of the Argentinean and Latin-American biophysical community often publish our work in physiological journals, and I am sure many members of the Physiological Society do the same (at least when you do not publish in the *Journal of Physiology*!). Many physiologists worldwide also attend the very successful US Biophysical Society meetings. So there is clearly a "grey zone" into which the two disciplines of physiology and biophysics merge, enabling us to learn from each other. I am confident the meeting will be a superb opportunity for this transfer of knowledge.

A bit of history

Argentina has a long scientific tradition in biological sciences, and, since 1945, several scientists working (B. Houssay and F. Leloir) or trained (C. Milstein) in Argentina have won Nobel Prizes. In 1972, a group of Argentinian biophysicists interested in bio-membranes, transport processes, and ATPases founded the Argentine Biophysical Society (Sociedad Argentina de Biofísica, SAB). This is the oldest Biophysical Society of Latin America and became a member of the IUPAB in 1973. Biophysics is an active research area in Argentina. Most of the over 200 members of SAB are involved in University teaching, and biophysics is taught at Schools of Biochemistry, Agricultural Sciences, Medicine and Dentistry. There are also postgraduate courses in biophysical subjects at several Argentine Universities.

The SAB has been very active in organising scientific meetings, both independently and jointly with other learned societies, such as the Argentine Societies of Biochemistry and of Neurochemistry. In 1987, SAB organised the first Southern Cone Congress of Biophysics, an important step towards the integration of biophysical sciences in South America. The idea flourished, and three further Southern Cone meetings have taken place, the last one in 2000 organised jointly by the Brazilian and Argentinian Societies of Biophysics. The SAB ethos of promoting communication and co-operation between Scientific Societies with related interests also extends beyond the immediate region, leading for instance to the organising of the III Ibero-American Congress of Biophysics, held in Buenos Aires in 1997. Many other successful international meetings in more specialist areas have also taken place in Argentina during the last decade, including international symposia or courses on "Oxygen Radicals in Biochemistry, Biophysics and Medicine" (Buenos Aires, 1994), "New tools in Membrane Transport Studies" (Buenos Aires, 1994), and on "The Na, K-ATPase and Related Transport ATPases" (Mar del Plata, 1996).

The IUPAB Congress will be a great boost to biophysics in Argentina in particular and in Latin America in general. Exposing our science and our laboratories to the international community will be of great importance for all of us here, but especially for our younger research fellows.

A bit of Argentina

Argentina is a country of enormous contrasts:

from the immense Eastern plains to the breathtaking Andes in the West and the great peak of Aconcagua (6,959 m); from the northern Jujuy with its "painted mountains", south to the Perito Moreno glaciers and further on to Tierra del Fuego and Usuahia, the world's southernmost city. Whatever you are looking for, you will find it here: the high plateaux of the Northwest; the lakes, forests and glaciers of the Patagonian Andes; or the low rolling hill country, where pools and marshlands show the ancient courses of great rivers, and rock fissures form natural wonders like the Iguazú Falls. And then there is "La Pampa", the Pampas, the world-famous area of the plains in the centre of Argentina. Yet more contrasts await if you travel through Patagonia from the Andes to the sea, where stark and stony plateaux are buffeted year-round by the wind. The Atlantic coast, lined with high cliffs and massive indentations such as the Valdés Peninsula, offers unique colonies of marine animals and the special attractions of the Mendoza wine country.

A bit of Buenos Aires

The federal capital of the Argentine Republic is one of the cultural centres of South America. Its diversity and bustle echoes the most varied idiosyncrasies and essences of the many cultures brought here by immigrants from all over the world. Music ranges from the tradition and prestige of performances at the Colon Opera to the *barrio* of San Telmo with its famous "Tango". Apart from the many official cultural centres, like the National Library and the Museums, the living culture of the city flows through the Buenos Aires streets day and night. Stroll through La Recoleta, famous for its superb restaurants and sidewalk cafes, close to the Fine Arts Museum and the oldest Church in the city; or visit the colourful old Italian quarter of La Boca, located on the edge of the city by the mouth of the river Riachuelo, celebrated by Genoese sailors and Argentine poets. Buenos Aires has all these possibilities, together with many, many, more.

So to sum up, why not make a date with the IUPAB Conference in one of Latin America's great cities? Buenos Aires and Argentina have a lot to offer, both scientifically and "touristically"! I hope many of you will choose to visit us, so we can meet, talk science and forge more scientific links between Latin America and the wider world.

Dr. Jorge E. Ponce-Hornos

General Secretary
Sociedad Argentina de Biofísica

http://www.biofisica.dna.uba.ar
iupab02@mail.retina.ar

Some important information:

To receive final congress mailing you can sign-up online via the SAB website (URL given above) or via the IUPAB website at http://www.iupab.org.

Deadline for abstract submission will be the end of December 2001 (note that for younger scientists applying for travel support the deadline will probably be one or two months earlier).

COMMITTEE OF HEADS OF DEPARTMENTS OF PHYSIOLOGY

The article on "Whither Physiology" in the Summer 2001 issue noted that the majority of members no longer work in straightforward "Physiology Departments". What does this mean for the so-called "Committee of Heads of Departments of Physiology" (HoDs) that meets twice a year at Society Meetings? What is the purpose of the Committee, who are its members and what can it usefully do?

Its purposes are:

- a forum for the exchange of information about what is happening of relevance to Physiologists in different Institutions
- to make responses to various "consultations"
- to act as a conduit between the Physiological Society and members as departmental groups.

For any of these to function the membership of the group needs to be appropriate and needs to be kept under review. Basically we need to locate departments where groups of Physiologists work. If the Head of a particular department happens to be a Physiologist, and wishes to attend the HoDs Committee Meetings, then they should. If this is not the case, then a senior Physiologist in the Institution should represent the Department. This works best if they are reasonably close to the management, and are there with the agreement of their Head of Department to represent the department, and can therefore report effectively and authoritatively to and from the Committee of Head of Departments. However, membership of the Committee is inclusive. We are happy to see actual HoDs as well as senior physiologists. Similarly we put non-attending HoDs on the mailing list seeking agenda items and the Minutes as an additional channel of communication. The objective is to achieve the most effective communication and a strong "departmental" slant to the Committee's activity.

The Committee of HoDs can make responses to "consultations" that complement the views of the Society expressed through its Council. Members of the Council are elected to represent the views of members and we are not attempting to duplicate this. However, the HoDs group comments, through its Chairman, to Government, Quangos and other organisations on consultative processes, from the particular, practical view of Departments that practice physiology teaching or research. These views are unlikely to be in opposition to those of members in general, but have additional elements based on the reality of running a department, and maintaining the long-term vitality of the subject in an institute of higher education.

The HoDs act as a useful conduit between the Physiological Society and members as departmental groups. This complements the Society's communication with individual members. This is a two way process and could be developed in various ways. To facilitate this, the current Chairman (Ian McGrath) has been an observer at Society Committee meetings for the last year and he believes that the awareness of current events that this provides is necessary for the Chairman to be of use to the HoDs Committee. It has now been recommended by the Committee that this observer status be continued on the new Council.

It is vital that we get the composition of the Committee right. The database has been brought up to date and we are very interested to hear from members about any mistakes or departments that we have missed, whatever they are "called".

Professor J C McGrath

University of Glasgow

Chairman of the Heads of Department Committee

EDUCATION COLLOQUIUM AT BRISTOL

As part of the Biochemical Society's meeting, their Education Sub-Committee organised an Education Colloquium about the changes in post-16 school education. There were a variety of speakers, from Edexel and QCA, as well as a Head of Science from a comprehensive school and a University Admissions Tutor.

The day started off in a very upbeat style, with the representatives from QCA stressing the extra breadth and choice that youngsters would now have, and how this would lead to more rounded and multi-skilled university entrants. This was echoed by the representative from Edexel, who talked about the variety of possible 'AS' levels available, and the different routes and choices a young person could make. All seemed promising and bright.

However, the teacher threw a different light on the issue. He explained – as many of you involved in admissions will know – that the traditional 3 'A' levels have been extended with many students taking 4 or 5 ASs in their first year, and then 3 or more A2s in their second year. And of course, as Biology is seen as the most interesting and accessible of the science subjects, it is a popular choice as an AS by those concentrating on the humanities and arts subjects. This is exactly what was said by the QCA – here we have students enjoying a more varied education. But the costs are heavy. First year 'AS' class sizes have increased by 80% in state schools, and by over 50% in independent schools. Where the largest 'A' level classes used to be 20-25, some teachers are now facing classes of 40. How can a practical class be undertaken, in the same laboratory with the same amount of facilities and nearly twice the number of students? It can't, of course, and so the more complicated practicals will be ditched in favour of demonstrations and computer simulations, thus decreasing the amount of practical training a student will receive. The other effect that the increased number of 'A' level equivalents will have is that students will spend more time in the classroom, and less in private study, decreasing the time allowed for development of personal study skills upon which they will rely at university.

And finally, what about the students themselves. 'A' levels were always stressful, being the gateway to the relative heaven of university and coming at an awkward stage of personal development. With an increased number of subjects, and, therefore exams, cases of depression in schools are escalating. It is feared by many that this set of examination results will not be as good as hoped, and even if they are, the first year is often not a useful predictor.

So what is the answer? Estelle Morris has called for a review of the system, in which we, as part of UKLSC, hope to be involved, as representatives of university educators. How important are practical and study skills learned at school for first year undergraduates? Do you foresee the increased breadth of education as having a positive effect? I would be interested to hear your comments.

Maggie Leggett

ERRATUM

The Editor would like to apologise for the two errors that appeared in the letter written by Professor Greenfield published on page 4 of the Summer 2001 Issue of the magazine (no 43). Clearly, Bancroft should have been Barcroft, and Ruddie should have been Roddie.

UKLSC ANIMAL SCIENCE GROUP

The Animal Science Group met on the 15th May. At the top of the agenda was the interdepartmental ministerial Committee, which has been set up to co-ordinate policy to protect those working in animal research from extremists. The group aims to work as closely as possible with this Committee. As currently there is no central source of information on the number and type of incidents of violence or harassment, it was suggested that all academics should try to establish and encourage accurate record keeping in their University. This would be useful evidence that may, in time, be brought to the Ministers' notice.

Dr Vernon Barber

Another area in which the group has been involved is lobbying for changes to the Criminal Justice and Police Act, to give the police more power when dealing with animal rights activists. The recommended changes have now been given Royal Assent, and it was agreed that it would now be important to work with the police to aid implementation of the alterations. A 'special police squad' has been set up and it is possible that a meeting will be arranged with representatives of the group.

With regard to the new project licence application forms, it was reported that, although industry would be carefully monitoring the effects on their employees, there was unlikely to be any formal recording in Universities. To aid this, members of the group will prepare a questionnaire to be sent to a selection of academic and research establishments after a few months' experience with the new forms. The planned workshop on these application forms which is part of the Bristol meeting programme was instigated by the Home Office. This was seen as a very positive step forward.

The House of Lords call for evidence on the Use of Animals in Experimentation was also discussed. The UKLSC response is available on their website, to which there is a link from ours. The Society response appears in full in this copy of the Magazine. The Lords may ask for oral evidence, most probably in September or October. This will be reported in future issues of the *Magazine*.

This is only a summary of the items discussed and current initiatives, and is certainly not exhaustive. Although Sarah-Jane Stagg, the Executive Officer of the British Pharmacological Society, provides excellent administrative support for the Animal Science Group, it was clear that she and the Chairman (Professor Nancy Rothwell) required further assistance. To this end Dr Vernon Barber has been recruited to work approximately half time as a project manager and consultant. Vernon has had a full and varied career so far, including over 30 years in academia and latterly science advisory work for the National Farmers Union. His appointment is supported by various member societies including The Physiological Society, and we are sure his appointment will lead to this group being even more effective.

Maggie Leggett

BE A CONTROL FREAK

'Oscar winners live longer,' screamed the headlines when some Canadian researchers announced the results of their survey of movie actors earlier this year. The ones who had earned the right to give a tearful speech lived, on average, between four and six years longer than their less successful colleagues. The explanation? It's all down to stress – or lack of it – we're told. Making it to the top means you can relax. The same holds true for a less glamorous group of workers. A study of British civil servants found that it was the ones at the bottom of the pecking order, rather than the people in the most responsible positions, who were most likely to suffer from stress-related heart disease. It seems that what counts is being in control. While top civil servants might appear to have the more stressful jobs, it's actually the people they order about who suffer the most. And presumably those Oscar winners have the pick of the scripts.

So the key to a long and happy career in science is to take control of your destiny. DON'T do a(nother) postdoc just because it's the path of least resistance. DO do one if your passion for research burns bright AND you see ways in which the new contract can help your personal and career development. It might seem like an

amazing concept to the unhappy serial postdoc, but I've actually met someone who likes working on a series of short term contracts. He even left a permanent industry job to return to academia to do just that. The appeal for him is flexibility, but the point is that it's the way he's actively chosen to go.

Decide what it is you want from your working life, and then go for it! And don't be narrow when you're considering your options. It's very easy to be sucked into an academic or industry career path just because that's what everyone around you is doing. Don't get me wrong, one or other of those routes could be the perfect one for you, but you wouldn't decide that your favourite fruit was apples based on a total taste test of Granny Smiths versus Victoria plums, would you? I'm sure you know that a scientific training opens numerous doors, but taking a peek inside even a short corridor's worth of them can seem like a daunting prospect (especially when you're trying to run a gel, keep up with the literature and write a paper at the same time).

Fortunately there are LOTS of short cuts when it comes to narrowing down your career choices. One of the best places to start is at one of the Life Sciences Careers Conferences coming up in November (see opposite). They are organised by the Physiological Society and some of the other learned societies which are members of the UK Life Sciences Committee. A full day's programme of talks pushes the door ajar to a variety of career paths. Perhaps more valuable still, you can collar the speakers, and representatives from other organisations which exhibit, during the coffee and lunch breaks to find out more about what makes their job work for them. Last year I had a fascinating conversation with one exhibitor, an industry scientist who had moved from one of the large multinational pharmaceutical companies to work for a much smaller firm. He was finding a lot of job satisfaction from being a big fish in a small pond, and from the greater variety of his work. Having to wear a Human Resources hat part of the time might not be every scientist's cup of tea, however. Those are the conversations which can help you define your niche.

Networking really is crucial when it comes to job hunting, and if you need to practise, the Careers Conferences are a great environment to do it. It's a skill which *Science*'s Next Wave, the weekly career development web magazine which I help to write and edit, offers lots of advice on. Next Wave (www.nextwave.org) is aimed particularly at PhD and postdoctoral scientists, so we ask people who have gone down that route and found career success to share their experience. Importantly we ask them to give us a warts and all account. Rebecca Pool, who works as an Associate Programme Manager at a Research Council, is a typical example. She cites some good points as "finding out about the latest research issues and innovations, and to a certain extent "steering" research paths but warns "we have to juggle several tasks at any one time," and "if you are aspiring to riches, then I'd give this one a miss."

This may be the first time you've heard of the Careers Conferences or Next Wave, but there's one incredibly valuable career resource which I can guarantee you'll be very familiar with, even if you've never thought of them in that light before – your friends and family. Where do they work? Do they like their jobs? Do they know people who work in an area that you might be interested in? Most people find it very flattering to be asked for their help and advice in learning about or breaking into a new field – I know I do!

You have to use all the resources open to you because your dream job won't miraculously land in your lap. I interviewed a 'change management consultant' once. That's a polite way of saying a guy who's brought in to help people who are being made redundant find a new job. "Finding a job is a job in itself," he told me. As someone who has filled in more than a few job applications in her time, I know that's true. Well, building a career takes a working lifetime — but it's well worth doing, especially if you want to be able to enjoy a long and healthy retirement!

Kirstie Urquhart

Kirstie Urquhart is UK Editor of Science's Next Wave.

AFFILIATE RENEWAL 2001 / 2002

As we draw to the end of another academic year it is time to renew your Affiliate Membership with the Society.

The fees for the coming year, September through to next August, will be just £15.00 for UK and Eire based members, and slightly higher for Europe and the rest of world. Still excellent value for money given the benefits available.

With the changes agreed at the 2000 AGM it is now even easier to join as a full Member and receive the benefits, and enjoy the prestige which this carries. If you are nearing the end of your five-year affiliate term, or have moved on in your postdoctoral research and feel your membership should move on too, please contact us for further information. We would be more than happy to advise, or alternatively please see our Website, where information is easily obtainable.

To ensure that there is no interruption with your magazine and meetings notice delivery, please ensure that your cheque, for the correct amount, is returned to us by 30 September 2001.

If you wish to continue your Affiliation, you should renew now.

The Treasurer has agreed the following fees for the coming year:

UK & Ireland £15
Europe £35
Non-Europe £40

Please send your cheque, made payable to 'The Physiological Society', to The Administrator (Affiliation Renewal) **before the *end* of September 2001**.

The Administrator (Affiliation)
The Physiological Society
P O Box 11319
LONDON WC1E 7JF

SOCIETY MEMBERSHIP CRITERIA AND BENEFITS

How to become a Member of *The Physiological Society* and the benefits of doing so

Main Criteria

You are eligible to apply for Membership of The Society if:

- You have presented at a Society meeting – oral communications, demonstrations and poster communications; and you have published a paper on Physiology in a peer-reviewed journal, including Molecular and Comparative Physiology

  or

  Published two papers on physiological topics in the Journal of Physiology, Experimental Physiology or another peer-reviewed journal
- You are intending to stay in Physiological Sciences.
- You can obtain four signatures of current Members of the Society to verify the above.

Benefits

Free Quarterly Magazine
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Free Programmes to all Society Meetings
Free attendance to Society Meetings – no registration fee
Free Membership Directory (The Grey Book)
Able to introduce guests to all Society Meetings
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Subscribe to the Journal of Physiology, at a discounted price
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Apply for Grants from the Society – for yourself and Young Physiologists
Introduce New Members and Affiliates to the Society
Access to the wide range and varying Special Interest Groups – an invaluable resource of like-minded scientists
Vote at General Meetings

Discounts on many publications from cognate Societies
Able to attend meetings of other Societies (e.g. Biochemical Society) at a reduced rate

PFIZER PRIZE

A Pfizer Prize round was held at the Society's Oxford Meeting, 19-21 March 2001. The successful candidate was Mr Pedro Boscan (University of Bristol) for presenting Oral Communication:

C66 Pedro Boscan and Julian F.R. Paton.
Nociceptive afferents modulate the peripheral chemoreceptor reflex via an action within the solitary tract nucleus.

The award will be presented at the Joint Meeting with the British Pharmacological Society in Bristol, 5-7 September 2001.

The next Pfizer Prize round will take place at the Bristol Meeting in September. Nominations are invited for the Cellular Neurophysiology, Microvascular & Endothelial Physiology, Sensory Functions and Somatosensory Physiology Special Interest Groups.

Further details and nomination forms may be downloaded from the Society's web site (http://www.physoc.org/Meetings/future.html). Alternatively, contact the Meetings Secretary's Office, tel: (0114) 222 2390 or email meetings@physoc.org.

EVENTS SUPPORTED IN 2001 UNDER THE NON-SOCIETY SYMPOSIA GRANT SCHEME

Conference: CVB2001 – Cerebral Vascular Biology 2001

Cambridge, 1-5 April 2001

Forthcoming Events:

Symposium: Molecular and Functional Aspects of Vascular Development

Sydney, Australia, 19-23 August 2001

For further information contact Professor Lucilla Poston, email lucilla.poston@kcl.ac.uk

Workshop: Vertical Integration in Biology: from Molecules to Organisms

(A Newton Institute Workshop)

Cambridge, 24-28 September 2001

For further information, email info@newton.cam.ac.uk or visit web site http://www.newton.cam.ac.uk/

Symposium: Islets and Type 2 Diabetes

St Michael's Hospital, Bristol, 19 October 2001

For further information, contact Dr Guy Rutter, email g.a.rutter@bristol.ac.uk

Symposium: Genes and Sport

University of London, 30 November 2001

For further information, contact Dr Bruce Lynn, email b.lynn@ucl.ac.uk

COMPARATIVE PHYSIOLOGY SIG

The plan to hold joint sessions with other sections that have complementary interests got off to a very successful start with a symposium on 'Vagal control from axolotl to man', organised by Teresa Thomas of the Cardiovascular/Respiratory Control SIG and myself, held at the Oxford meeting. This year's Designated Lecture was 'The crocodilian heart – more controlled than we thought?' given by Michael Axelsson from the University of Göteborg, Sweden (see Franklin CE, Axelsson M. An actively controlled heart valve. *Nature* 406: 847-848, 2000). The evolutionary theme was well received by members of both camps, and many an excited discussion was continued in the various ale houses nearby. The level of interest generated resulted in an invitation for the participants to contribute their papers to a special issue of *Experimental Physiology*.

We intend to continue with an annual session, so please consider submitting a piece of work, and encouraging your colleagues to do likewise, in order that we maintain the great diversity of presentations that has so far been favourably received. Plans are being developed for a joint session with the Comparative & Invertebrate Neuroscience SIG (with Bill Winlow from Central Lancashire) for 2002, and Muscle SIG (with Ian Johnston from St. Andrews) for 2003, and new suggestions are always welcome.

Have a good summer!

Stuart Egginton

Dr S. Egginton
Convenor, Comparative Physiology Special Interest Group
Department of Physiology
School of Medical Sciences
University of Birmingham
B15 2TT

Tel: +44-(0)121-414-6902
Fax: +44-(0)121-414-6919

email:s.egginton@bham.ac.uk

FORMATION OF THE BRITISH SOCIETY FOR NEUROENDOCRINOLOGY

On 1st May 2001 The British Neuroendocrine Group will change its name to the British Society for Neuroendocrinology (BSN). This name change reflects the increasing importance of neuroendocrinology in human health and disease, and the growing stature of the group.

The British Society for Neuroendocrinology was formed as the British Neuroendocrine Group in 1985. It exists to promote research into endocrine and central nervous systems that interact to control key body processes including body weight, eating, stress, growth, sleep and reproduction. The ultimate aim of this research is to provide therapies for the many neuroendocrine diseases and disorders, and to bring forward methods to regulate beneficially normal neuroendocrine function in man and animals.

The British Society for Neuroendocrinology publishes the internationally renowned "Journal of Neuroendocrinology" and organises regular meetings and symposia. It is a member of the Federation of British Endocrine Societies and is affiliated to the Institute of Biology and the International Neuroendocrine Federation. It is a registered charity.

More information can be obtained from: www.neuroendo.org.uk

PROFESSOR JOHN H GREEN

born 29 July 1919 – died 25 August 2000

Professor John Green was not only a colleague in the Middlesex Hospital Medical School, but a friend and mentor. He spent most of his academic life in the Department of Physiology, a department which, under the leadership of Professor Samson Wright, had earned a reputation for excellence in teaching. John Green continued the tradition.

He was born on 29th July, 1919 and at a very young age showed an interest in electronics, making a television set while he was still at Westcliffe High School in Essex. His interest in technology not only benefited staff and students in the Medical School, but also his two sons for whom, amongst other things, he built a miniature railway in the garden. He was a student at Cambridge, where he obtained a natural science tripos, and then at the Middlesex. However his studies were interrupted by the Second World War, when his early bent for technology was harnessed by the School of Signals at Catterick. He made significant contributions, ending the war as a major. His circuit drawing technique was adopted by REME.

After qualifying in 1951, he embarked on research into the cardiovascular and respiratory systems, obtaining a PhD in 1954. He was elected to the Physiological Society in 1958 and became a Reader in 1960. The title of Professor was conferred on him in 1968. As well as publishing many research papers, his technological creativity led at one time to him holding three patents, including a finger cuff for monitoring post-operative blood pressure. He also published on teaching, which he, again, approached with enthusiasm. Generations of students, both medical students and nurses, benefited from his clear concise summaries and the elegant models he prepared to demonstrate a point. His understanding of the requirements of what we now call the 'core curriculum' led to his publishing *An Introduction into Human Physiology* in 1963. This text, with its numerous simple line diagrams and flow charts, became a best seller and was translated into several languages. John Green was particularly proud of the Japanese edition. This was followed by *Basic Clinical Physiology* in 1969 and an *Introduction to Human Anatomy* which he wrote with Professor PHS Silver in 1981.

He was able to make good use of his knowledge of technology in developing novel techniques for teaching Physiology. Under his chairmanship, the Audio-visual Aids Subcommittee of the Board of Studies in Physiology of London University produced a series of tapes booklet programmes supported by WHO and at the Middlesex he set up a superbly equipped studio to prepare videos etc for teaching. It is hardly surprising that, given his love of the subject, his two sons followed him into medicine. Despite his many activities, his family was always very important to him and in recent years he was able to enjoy the company of his grandchildren. Sadly, his wife Lynda died in 1998.

Mary L Forsling

GKT School of Medicine
Neuroendocrine Laboratories
Room 2 – 38a New Hunt's House
London Bridge
London SE1 1UL

GERALD WISEMAN MB BS MD PhD

born 12 December 1923 – died 8 December 2000

Gerry was born in London in 1923. He started his 2nd MB at University College London in 1942 and graduated from University College Hospital with an MB BS in 1947. He applied for, and was speedily given, a position as Lecturer in Physiology in 1948. He retired as Reader in Physiology in 1989 and until his death, was an Honorary Lecturer in the Department of Biomedical Science.

As a medical student, he had thought that the current mechanisms for the intestinal absorption of nutrients were unlikely, and so embarked upon his life's work to attempt to elucidate the real mechanism. In 1949 research workers in the Department of Biochemistry, in which Gerry spent much of his time, were estimating amino acids with bacterial enzymes so that, with the appropriate preparation, amino acid transfer could be studied. The preparation he devised, a small segment of rodent intestine turned inside out and formed into a small sac, was destined to place Sheffield on the intestinal transfer map and would make the Department of Physiology into the mecca for intestinal transfer for the next two decades. Gerry showed that the transfer of amino acids across the intestinal cells into the blood stream was actually an active process rather than simple diffusion relying on a carrier-mediated transfer mechanism i.e. a pump.

Gerry was a nice man and very easy to get on with but was the archetypical loner. He could be very difficult to know but if you succeeded in breaking through his barrier, you were treated to a person with a considerable intellect and, on rare occasions, a surprising sense of humour. In a biting but surprisingly perceptive article written about him for the Sheffield University medical student magazine *NorthWing*, Gerry was described as "a low-sized enigmatic man who achieved the gravity and maturity of an adult at the age of 2 and saw no good reason to change it". Indeed Gerry had the ability to sustain a physical appearance which was virtually unchanged, until near the end, over the four decades that I had the privilege to know him.

Anthony Angel

University of Sheffield
Department of Biomedical Science
Western Bank
Sheffield S10 2 TN

Your Professional Body

The Institute of Biology is the only professional body representing ALL biologists in the many sub-disciplines that constitute the biosciences today. The Institute is a registered charity, charged by Royal Charter to represent UK biologists and biology, and has a mission to provide a much-needed, unified Voice of British Biology.

Nowhere is this unity more important than in the political arena. Too often the wishes and opinions of the Societies representing sub-disciplines have gone unheard. However, when they join together and speak as one, they become a force to be reckoned with. It is just this that has encouraged 80 independent societies, including the Physiological Society, to affiliate to the Institute of Biology.

In addition to Affiliated Societies, 15 000 individual members are represented by the Institute of Biology. There are a variety of grades of membership, depending on your needs, qualifications and experience. Full Membership and Fellowship are accompanied by *Chartered Biologist* (CBiol) status – the professional qualification for UK bioscientists. The Institute of Biology is:

Proactive – identifying tomorrow's hot topics.

Interactive – journals, discussions, links, advice and jobs online.

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20 Queensberry Place
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