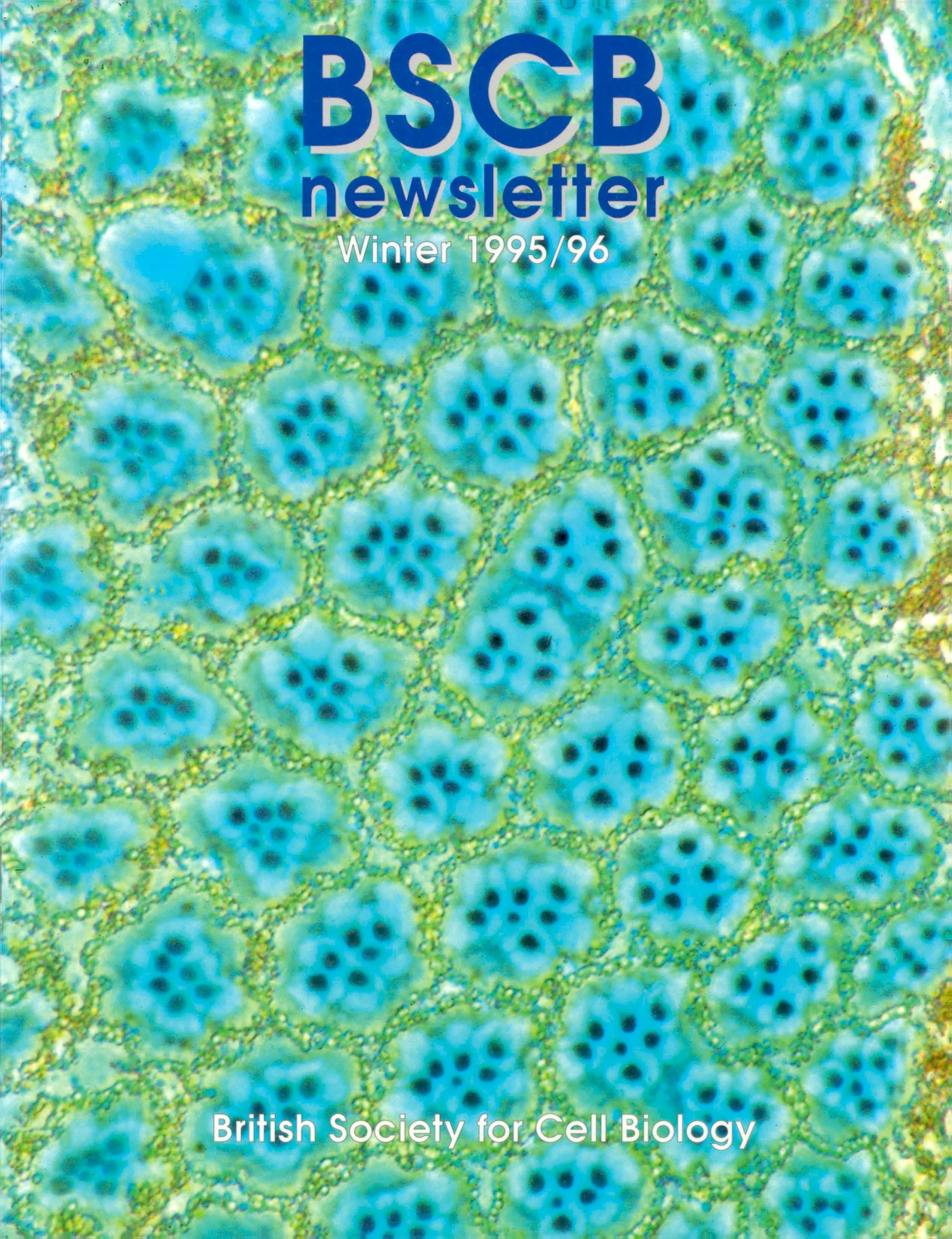
BSCB newsletter

Winter 1995/96



British Society for Cell Biology

BSCB Newsletter

Contents Winter 1995/96

The cover photograph shows the effects of over-expression of *argos* in the *Drosophila* eye, which causes too few photoreceptors to be recruited (see Freeman, M (1994) *Development* 120:2297–2304) **Robert Howes and Matthew Freeman,** MRC Laboratory for Molecular Biology, Hills Road, Cambridge CB2 2QH.

This newsletter was compiled by Theo Bloom and printed by The Company of Biologists Ltd.
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British Society for Cell Biology and Journal of Cell Science

Announcement of

Six bursaries for young scientists

from Bulgaria, Commonwealth of Independent States, Czech Republic, Slovakia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and the former states of Yugoslavia *to attend*

The BSCB/BSDB Spring Meeting at the University of York, 27–30 March 1996

Main symposia / workshops:

- *Signal transduction*
- *Regeneration, growth and pattern*
- *Green fluorescent protein*
- *Reading the Genome*

Bursaries will cover the cost of registration, accommodation and meals, and in 1996 a travel award of up to £250 per person. Applications, in duplicate, including a brief CV and concise reasons for wishing to attend should be sent to: Dr Birgit Lane, CRC Laboratories, Department of Anatomy and Physiology, Medical Sciences Institute, University of Dundee, Dundee DH1 4HN.

BSCB members — if you know of any young scientists from central and eastern Europe who would benefit from attending this meeting, please send them the above information.

The value of versatility

A profile of multi-talented cell biologist Hugh Pelham by one of his long-time collaborators.

Sean Munro, MRC Laboratory of Molecular Biology, Hills Road, Cambridge CB2 2QH.

Formative years

Hugh Pelham was born and raised in rural Hampshire. Being the son of a lecturer in geography he already had the notion of a career in academia, and at school found himself most interested by science in general and chemistry in particular. Reading John Kendrew's *'The Thread of Life'* inspired an interest in the chemistry of life and lead to him starting a degree in Biochemistry at Cambridge University in 1972. This was in the era of student nonconformism, and with his long hair and scepticism of the University hierarchy, Hugh was by no means alone. However his enthusiasm for science withstood the first-year lectures, and like many students who have passed through the Department of Biochemistry in Cambridge he was inspired by the vitality of the work on protein synthesis going on in the labs of Richard Jackson and Tim Hunt. He applied to stay on in Cambridge to do a PhD in these labs and was accepted.

That summer of 1975 was one of transition, and after a Budget Bus trip to India and a haircut, he arrived in the lab in October to throw himself wholeheartedly into a PhD. He was assigned a project which hindsight shows to be as naive as it was ambitious. It was to set up an in vitro transcription–translation system into which eukaryotic chromatin could be placed and the gene products it specified could then be synthesised for analysis. As it happened, he was only able to get the second part of this process to work by showing that Tim Hunt's scheme for an mRNA-dependent reticulocyte lysate would indeed work in practice. This system for in vitro translation is still the method of choice twenty years later, and the paper describing it is one of the most frequently cited papers of the modern era.

Hugh Pelham, the student

Hugh had been doing his PhD for less than three months, so having developed this system he had to find something to apply it to for the remainder of his three years. In the era before Bluescript and T7 polymerase, the best sources of pure single mRNAs were viruses. Many such viral mRNAs had been isolated from purified virions and these could be put into the reticulocyte lysate system and the encoded proteins identified. Thus, Hugh's earliest scientific contributions were in the field of virology, perhaps the most important being the demonstration that the proteolytic processing of both animal and plant virus polyproteins was catalysed by the virus proteins themselves. However, this was just one of

nine first-author publications from his three-year PhD, and he ended up being in the position to do a post-doc anywhere he chose.

By 1979, the revolutionary impact of recombinant DNA techniques on biology was becoming clear and Hugh chose to pursue the first part of the problem he had been set as a PhD student — how get the transcription of eukaryotic genes to work in vitro. Thus he travelled to Baltimore in the USA to the group of Don Brown, whose lab had successfully expressed the *Xenopus* gene for 5S RNA in an in vitro system. At the time, the Brown lab was in a race with the lab of Bob Roeder to isolate the protein that bound to the 5S gene — the first eukaryotic transcription factor, TFIIIA. This factor was thought to be very scarce in cell extracts compared to its product, the 5S RNA which accumulates to high levels in a 7S ribonucleoprotein particle. Hugh realised that the protein component of the 7S particle, which comprises up to 10% of the protein of the developing frog oocyte, might be TFIIIA itself, and he was able to demonstrate that this was indeed the case. This system provides the cell with a simple negative-feedback loop to control the transcription of the 5S gene, and it also provided the Brown lab with the means of easily obtaining large amounts of the TFIIIA protein. As a result Don Brown was so excited he could not sleep, and Hugh was able to spend more time visiting the National Parks of America than is usually allowed post-docs.

A lab of his own

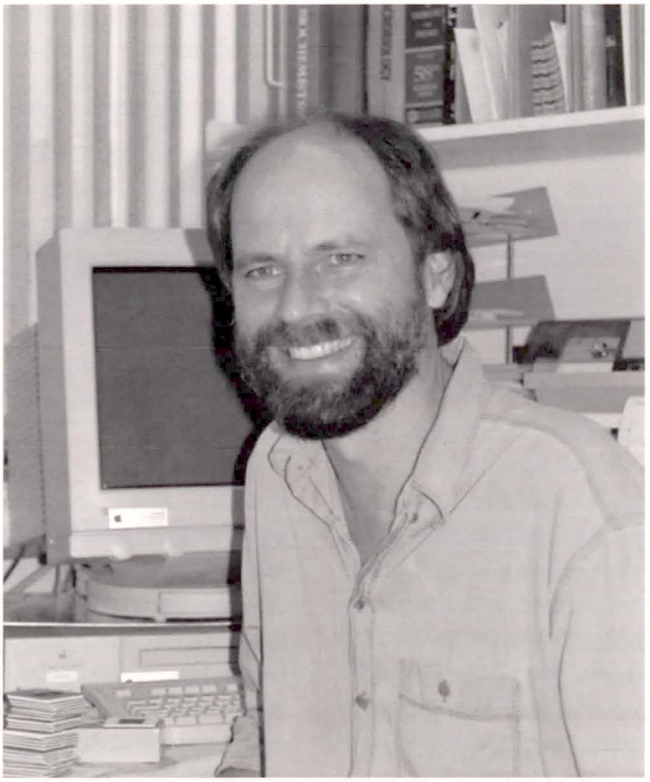
By this time Hugh's reputation was becoming established and Sydney Brenner persuaded him to return to England in 1981 to take up a five-year Staff Scientist position at the MRC Laboratory of Molecular Biology in Cambridge. Given the opportunity to set up his own lab, Hugh chose to continue studying gene expression, and in particular the question of how eukaryotic mRNAs were expressed in a regulated manner. To address this, he chose to examine how the gene for hsp70 was activated in response to heat shock. By transfecting deletion constructs of the *Drosophila* hsp70 gene into the newly developed COS cell system, he identified a short palindromic sequence (the Heat Shock Element or HSE) which is both necessary and sufficient for the heat shock response. This was the first regulatory element of a eukaryotic promoter to be described, and whilst with hindsight it might be said that Hugh was lucky to have chosen one of the simplest eukaryotic genes to study, this reflects rather more his approach to science. Hugh has always believed in thinking carefully about what experiments to try, and then devising an experimental strategy which will rapidly reveal if the chosen approach is likely to be fruitful. This is then coupled to a willingness to abandon a unpromising project and instead change direction if a more promising opportunity presents itself.

Hugh's career is marked by several such changes in direction, and a major change occurred in 1983 after the work on the HSE was published. The obvious next stage in the heat shock project would have been to isolate the protein which bound to the HSE — the Heat Shock Factor or HSF, but the rumour mill was already confident that Carl Parker's lab not only had the protein but also the gene. As will be described later this turned out to be false, but at the time competing seemed futile and Hugh decided to branch out. He had just teamed up with a gifted research assistant, Mike Lewis, who set up a screen for mammalian cells with mutations in the heat shock response, and he gave his first PhD student (me) the project of investigating the function of the heat shock protein hsp70. This latter project required the use of specific antibodies to determine the intracellular localisation of hsp70, but the only such antibodies in existence had been made by Susan Lindquist who was not prepared to give them out. This problem was in fact inspirational as it irritated Hugh so much that he resolved to work out a way of detecting the protein without having Susan's monoclonals. He realised that this could be done if the coding region of hsp70 was altered to include an extra peptide epitope that could be recognised by an anti-peptide monoclonal that was already available. I demonstrated that this idea could work in practice and the technique of epitope tagging was born.

Heat shock proteins

Epitope-tagging, however, did not bring us any nearer the intriguing function of the highly conserved hsp70 family. The search for cell lines with

mutations in the heat shock response was abandoned and Mike, Hugh and I devoted the period from 1984 to 1986 to wrestling with the function of hsp70, a question that seemed fascinating to us but totally pointless to most of our colleagues. Usually biologists choose a fundamental cellular process and try to identify the proteins that are involved in it. In hsp70 and its relatives we already had a family of proteins whose abundance and evolutionary conservation were such that we were certain that they had to be involved in something fundamental to all living things, and yet most known processes had been eliminated.



Hugh Pelham is Head of the Division of Cell Biology at the MRC Laboratory of Molecular Biology in Cambridge.

The solution to this problem evolved gradually in the lab, but two sets of observations where key. The first was that, in heat shocked cells, hsp70 bound tightly to nuclear and nucleolar structures, seemed to accelerate their recovery from heat shock, and could be released from them in vitro by the addition of ATP. This inspired Hugh to suggest that hsp70 promoted the repair of heat-damaged structures by an ATP-driven cycle of binding and release. The second was the realisation that the endoplasmic reticulum (ER) of unstressed cells contained a homologue of hsp70 (known as BiP or grp78) which bound to nascent secreted proteins in an ATP-regulated manner. Thus the notion of aiding the repair of proteins unfolded by heat stress was extended to generally aiding the folding of newly made proteins in normal cells.

The novel idea that general protein folding might be aided by cellular factors was spelt out by Hugh in a minireview in *Cell*. This was almost rejected as being too speculative, but in fact it has been cited over one thousand times to date and has had a profound influence on the field of protein folding. Indeed, even before these ideas were published, Alan Colman realised that they might explain the results of a colleague at Warwick University, John Ellis who had found a protein transiently associated with newly made proteins in chloroplasts and it was John Ellis who made the useful suggestion that the term 'molecular chaperone' might be extended from its original usage by Ron Laskey for the specific interaction between nucleoplasmin and histones, to cover the general aiding of protein folding. At the time the notion of proteins being essential for general protein folding was considered radical, but in less than ten years it has now become heresy to suggest that any protein folds spontaneously in vivo.

At this point, in 1986, Hugh could have devoted his lab to studying protein folding and assembly. However, after some initial quick experiments failed to yield promising results, he decided to leave folding to those with biophysical expertise and instead to follow up two leads which had arisen in the lab in the mean time and which looked more likely to yield promising results in the short term. The first lead had arisen from an American PhD student, Peter Sorger, who had been looking for suitable project to engage his tremendous energy and biochemical skills. Another student in the lab, Guy Riddihough, has set up assays for HSF as controls for a project to study the regulation by ecdysone of the small hsps in *Drosophila*. Against all reason, but encouraged by Hugh, Peter decided that the rumours that HSF had been purified by Carl Parker were premature, and he set out to purify the protein

himself. One year and one thousand litres of cells later, Peter had a single band on a gel and soon the corresponding gene for HSF. From this, Bent Jacobsen and he went on to investigate the means by which the factor can respond to heat shock and so initiate the process of activation of the hsp70 gene — the event which had initiated the whole study.

However, this was to be the last work in Hugh's lab on transcription as a second lead was to completely change the direction of his lab's research. This arose from the realisation that the hsp70 relative in the ER (BiP/grp78) was not secreted from the cell, despite having no membrane anchor to hold it in place. Investigation of this led to the discovery of the 'KDEL' ER retention motif and to the proposal by Hugh and me that this motif was used by the cell as a retrieval signal to capture escaped ER residents once they reach the Golgi and return them to their correct compartment. This breakthrough into the field of the secretory pathway was not planned, but it provided a way into an interesting area which was not as crowded and heavily exploited as transcription, and so Hugh decided to change the direction of his lab to follow up on this chance discovery. Because it was already becoming apparent that a system of choice for studying the eukaryotic secretory pathway was the yeast *Saccharomyces cerevisiae*, this change in field brought about a complete change in the lab's approach. One of the great strengths of the MRC's Laboratory of Molecular Biology is that it has allowed its scientists the freedom to follow up interesting leads. Sadly, it is hard to imagine many other research environments allowing a group to switch so easily from studying transcription in mammalian cells to studying protein secretion in yeast.

Into the secretory pathway

The obvious next question with the KDEL system was to find the protein which interacted with the signal — the KDEL-receptor. Thus, in 1988, having initially demonstrated that a similar system actually exists in yeast (it uses HDEL not KDEL), Hugh and a PhD student Kevin Hardwick carried out a genetic screen to identify mutants in HDEL-mediated retention. The clearest complementation group of mutants from the screen corresponded to a gene named *ERD1* (ER-retention defective), but careful analysis eventually revealed growth conditions under which this protein was not required for retention, and indeed the function of *ERD1* remains a mystery to this day. This left the lab without a receptor and rumours where arriving from Heidelberg that David Vaux and Steve Fuller had made a monoclonal against the KDEL-receptor from mammalian cells using an anti-idiotypic approach. This was probably the lowest point for Hugh's career — his lab had by now invested three years in this project and the risks of completely changing the direction of a small group where becoming apparent. However, the Vaux protein was not yet cloned, and the anti-idiotypic approach was a method of known fallibility. Thus, Hugh took the gamble of pressing on with the other, less promising *ERD* mutants. The appearance of David Vaux's work as a *Nature* article in 1990 was initially depressing, but in fact it did not describe the right protein and in reality it served as a useful smoke-screen behind which Kevin, Mike and Jan Semenza were able to identify a second yeast gene, *ERD2*, and to show that it was the receptor for HDEL. Neta Dean was able to demonstrate that this receptor recycled between ER and Golgi in yeast, and Mike and Duncan Wilson found a mammalian homologue of the ERD2 protein and demonstrated that it was a receptor for KDEL.

Since then, Hugh's lab has expanded to about five people, to accommodate more students and postdocs (Deborah Sweet, Gabriella Frigero, Fiona Townsely, David Banfield and Andreas Scheel) who have investigated aspects of ERD2 structure and vesicular transport between the ER and Golgi in both yeast and mammalian cells. The ERD2 protein shuttles continually between the ER and the Golgi retrieving escaped HDEL-proteins, and a genetic screen for proteins involved in this pathway produced a new yeast membrane protein, Sed5p. This was one of the first of the family of proteins called SNAREs, which are proposed to be the address markers which ensure that vesicles moving between the membranous compartments of the cell fuse specifically to the correct target membranous compartment. Studying the function and localisation of these SNARE proteins in yeast is now one of the central areas of interest of Hugh's

lab, involving recently started PhD students Stephen Wooding and Julian Rayner.

It is a common belief that scientists need ever larger teams to be successful. In this article I have mentioned by name every student, post-doc and research assistant who has worked, or who is currently working, with Hugh. These total just sixteen — not sixteen presently in the lab, but sixteen in total over 14 years of running his own group. This level of productivity has come from an approach to science which has been based on careful thought, an ability to get the most out of small bits of progress, and a preparedness to be opportunistic. This has been aided by a atmosphere at the Laboratory of Molecular Biology which has supported speculative and risking-taking research. Hugh no longer works at the bench himself and it is probably fair to say that although very hard working, he has always preferred thinking to doing experiments, which usually caused him to question the need for most steps in any protocol and to regularly crack gel plates in an effort to speed up his experiments!

The scientific achievements described above have inevitably brought Hugh a collection of prizes, awards and committee obligations, but success has left him unchanged — he is just as confident and outgoing as he ever was! — although the once ubiquitous T-shirt is now sometimes replaced by a jacket and collar. Where his lab will go in the future is hard to predict. The secretory pathway is entering an era of tremendous excitement and rapid progress, but it is unlikely to remain mysterious for long. At 41, Hugh has more than enough years left to devote time to his partner Mariann Bienz and their two young children, and also to make several more changes of scientific direction, but whatever he decides to work on, it will be approached with the same dedication, creativity and rigorous thinking that has impressed and inspired all who have worked with him to date.

The Teacher–Scientist Network

An introduction to a scheme run in Norfolk to provide links between school teachers and professional scientists.

Frank Chennell, Network Coordinator, Teacher–Scientist Network, Hurdle Cottage, Brisley Road, North Elmham, Norfolk NR20 5DL.

A strange party took place last year at the John Innes Centre in Norwich; It was the launch of the Teacher–Scientist Network. Sixty scientists from the Norwich Research Park, which includes the John Innes Centre, the Institute of Food Research and the University of East Anglia, could be found milling around with 60 teachers from around Norfolk, each trying to find their designated partner in a giant game of educational blind date. Since then, the teacher and scientist in each partnership have been in contact with each other, exploring ways in which the large and diverse science community in the area might be used to enhance classroom science. For teachers, the scientific community is a large untapped pool of information, ideas and help with resources. For scientists, there is the chance to be involved with local science education and to use their science skills in new ways. They are all helped in this by the appointment of an experienced schools science advisor to coordinate the Network. The scientists in the Network are from all branches of science and include research assistants, postgraduate students, lecturers, readers, project leaders and heads of department. The teachers are also a broad group, teaching science to all children, from four to eighteen years of age.

TSN
TEACHER SCIENTIST NETWORK

The idea of bringing together similar groups of teachers and scientists was started in San Francisco by Bruce Alberts (President of the National Academy of Sciences). It has been active now for several years and has spread to other areas in the USA. Although the Teacher–Scientist Network operates in a different educational context, like its American prototype, it is proving to be very successful in:

- enhancing classroom science by bringing in fresh, up-to-date information and other resources from the scientific community
- providing teachers with a professional science contact for information and advice
- providing scientists with an insight into educational processes and purposes, and giving them the opportunity to become involved
- providing children with role models and the conditions to dispel the 'boffin' stereotype
- creating a network of communication between the science community and the education community —including meetings to share experiences and ideas
- producing materials and new ideas for investigations in the classroom
- providing teachers with opportunities for first-hand experience in professional laboratories.

Now the Network is up and running, we have a steady stream of new applicants to join it. But what do the partners do? It depends on what they want. Some scientists may not be able to commit a lot of time, and some teachers may only need occasional contact when they seek help

Peter Shaw, from the John Innes Institute, visiting some children at the North Elmham V.A. Primary School in Norfolk.

or information, maybe about an area of science in which they feel insecure. Some teachers encourage visits from the scientist so that their children and the scientist get to know one another, children can talk to a 'real' scientist and get to know him or her (see photo). The scientist might become quite involved with some lessons and help the teacher or the children with investigations and other activities, perhaps by suggesting suitable contexts or procedures. Occasionally the scientist may make a more direct contribution to the lesson due to his or her special field of work, perhaps by showing samples or equipment, or by talking about their work. As well as offering advice and expertise when appropriate, some scientists may also be able to help with resources and materials for a particular section of school science work.

In addition to this core activity of the Network, it is also offering several teacher research Fellowships. These provide a paid opportunity for a teacher to work in an active research laboratory and to experience the fun of hands-on problem-solving activities. Additional money is provided for the lab and for the teacher to take back to use for the classroom. Meetings and conferences for the members of the Network take place, and members are kept in touch with one another by the coordinator, and by a newsletter. The Teacher–Scientist Network is an independent body and is run by a small steering committee of teachers and scientists. The Gatsby Foundation has generously provided funding to support it.

The idea of partnerships is simple, but it can provide a powerful, locally based, independent and grass roots mechanism for enhancing the ability of the hard-pressed teaching community to deliver the science education within the national curriculum. This is a novel and systematic route to increase, in its own small way, the future public understanding of science.

Call to members to attend the 1996 AGM

If you plan to attend the 1996 Spring Meeting in York (27–30 March), please make time to be at the BSCB's Annual General Meeting. **Food and drink will be provided** and your input into discussions will be warmly welcomed.

Your contribution can influence the type of meetings we hold and the way the society operates.

Going private

Soon more medical research will be funded from private sources than from the public purse. Peter Williams believes that the implications of such a shift need to be appreciated.

Peter Williams was formerly, from 1965 to 1991, Director of the Wellcome Trust.

> *'To give away money is an easy matter, and in any man's power. But to decide to whom to give it and how large and when, and for what purpose and how, is neither in every man's power — nor an easy matter.'* **Aristotle**

In 1992-93, the funds available for medical research in Britain from government and private sources (Medical Research Council (MRC) and Association of Medical Research Charities) was £504 million. The estimates for 1996 are £750 million. Most of this increase will be provided by the growth of the Wellcome Trust. The private contribution will by then be about double the budget of the MRC (see the graph on the following page).

The opportunity for a well-funded future for medical research is obvious. However, this growth raises a number of questions:

- Where and on what will the money be spent?
- Will the change-over in dominance from government to private have repercussions?
- Will the dominance of one non-government organization be acceptable?

The answers to these questions may have a great effect on this country and so it is important that we should consider the various possibilities.

The hope of all who do research and benefit from its discoveries is that this shot in the arm for British medical science will once more make this country a leader in the field of human endeavour.

The opposite view is that the government may neutralize this growth by cutting its expenditure. There is also the possibility that British institutions cannot raise their capacity to absorb and use these funds efficiently. To understand what may happen it is necessary to know the system by which medical research is funded at the present time.

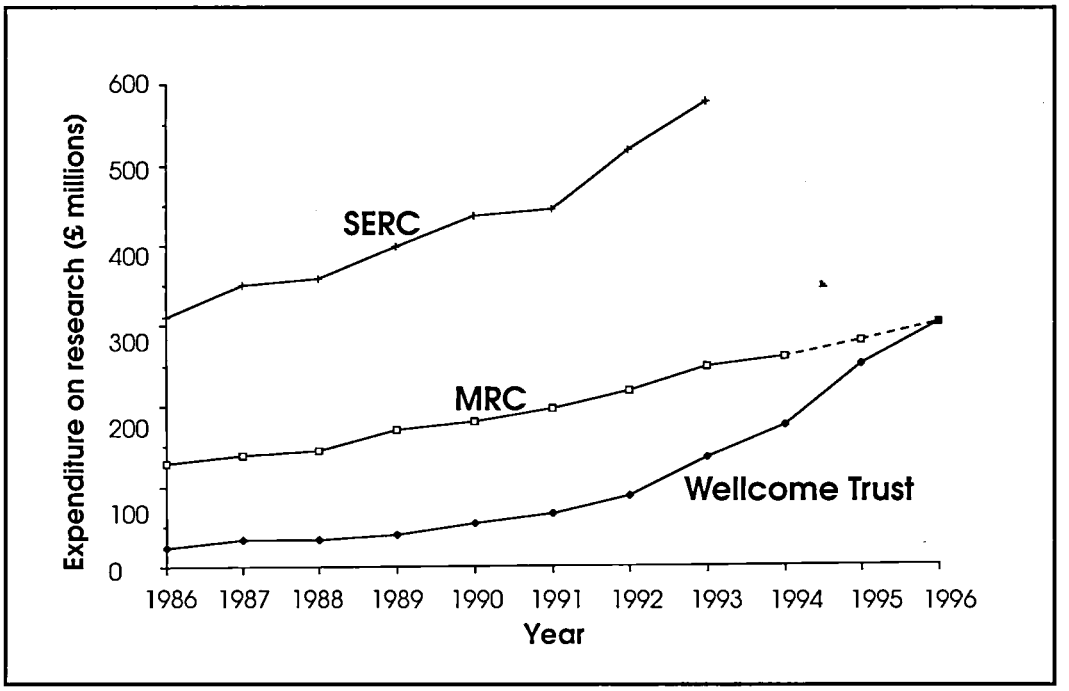
How can the money be spent?

There are only three possible avenues for supporting medical research:

- In industry
- In universities
- In research institutes

Each of these has its place, as well as its advantages and disadvantages. In industry (mainly the pharmaceutical) the object of research is to discover a new product that can be developed and sold for a commercial profit. This is an expensive process which consumes enormous sums of money but is the way in which nearly all today's active drugs have become available. Much original research is undertaken in this quest, as witnessed by the number of Nobel prizes that have been awarded to scientists in the pharmaceutical industry.

Universities exist to give selected people of academic excellence the opportunity to pursue their scholarship, to extend knowledge and pass on this



Expenditure by the Science and Engineering Research Council, Medical Research Council and the Wellcome Trust. The figures for 1995 and 1996 for the MRC are estimates.

experience to the next generation. They do not have the basic funds available to undertake modern laboratory research so they are very willing to accept support from outside sources to achieve their personal objectives.

Research institutes, which may be publicly or privately funded, are usually created for research in a selected field or, occasionally, to provide for the development of the work of an important innovative scientist.

Private and tax-payers' money cannot be spent in industrial laboratories. These funds can therefore only be used in the universities or in independent institutes. Funding bodies have to be very large if they are to run their own institutes. The government, cancer charities and Wellcome Trust are the only funds of this size in Britain. So, by and large, private and public funds are very dependent on the universities to fulfil their objectives. Whether these objectives can be successfully achieved therefore depends on the capacity of universities to use the funds effectively.

Outside the commercial sector

The funding of medical research on an appreciable scale can be dated from 1913, when the Medical Research Committee (later Council) was established by the government of the day. The research undertaken before that time occurred mainly in university laboratories, private institutions and the laboratories created by Henry Wellcome in connection with his commercial enterprise. Large sums were not required because of the relatively small scale and limited cost of these activities. From that time on, with gradually increasing pace, research has grown and more funding has been needed.

The principal source of funding for fundamental research has for many years been through government agencies, which have been created to back up the universities, and gradually assume more and more responsibility for them. Government funds also have been used to create research institutes of various sizes. More recently, the recognition that the NHS needs its own research has led first to the Ministry of Health providing support through its Chief Scientist's Office and later to the creation of the Department of Research and Development of the NHS.

In parallel with this government support, provision from non-government sources has been growing. Private citizens have wished to see more being done in specific fields in which they have a special interest. These activities have caused considerable sums of money to be made available for

specific diseases (e.g. muscular dystrophy, diabetes) or symptom areas (e.g. back pain). Especially noteworthy have been the large funds of the Cancer Research Campaign and Imperial Cancer Research Fund (£50 million each). The source of these funds has varied but has been mainly from legacies, collections or donations. And of course, the will of Sir Henry Wellcome also created his Trust for medical research.

The MRC annual budget of £259 million (1994 figure) is divided thus: 60% to its own institutes, units, groups, etc. and 40% in project grants to the universities. The project grants provided to the universities have an overhead payment of 40% added to the salaries element.

The charitable support of research is mainly provided in the form of project grants to the universities, but a few institutes such as the Imperial Cancer Research Fund laboratories are maintained. The government, through the Higher Education Funding Council for England (HEFCE), provides an overhead of 18% to the universities that receive charitable research grants in order to enable them to back up the research being supported. Contract research for industry attracts an even higher overhead. It is difficult to understand how there can be three different levels of overhead for the same function!

The universities have become increasingly dependent on earning these research funds and receiving the overhead element. The accounts of Cambridge University, for instance, show that £75 million of their annual income of £288 million comes from research grants and contracts. (This is not of course only in the medical field.)

Policy for the use of funds

If we take it that the policy for the use of funds will continue much as it is at present for other organizations, we must look to the policy statement of the Wellcome Trust to give us a lead to what changes we may expect in the future.

The strongest point is that it will make the prospects of a career in research greater. Instead of most research being undertaken before the age of 30 by individuals with short-term, poorly paid appointment, they can now hope for more continuity. This is an important advance, as much talent is wasted at present through lack of security. While applauding this move, we must not forget that if the fostering of originality is the purpose of the Trust, it will have to develop very strict criteria if it is to prevent the development of complacency. Some Jeremiahs may worry that the effect of larger funding will be damaging since they believe in the importance of proving one's ability through adversity: 'Make it too soft and the research workers will not devote themselves to it whole-heartedly.'

Other important possibilities are the capacity to attract researchers from abroad or make the so-called 'brain drain' less attractive. This aspect will be fostered if the facilities in this country can be improved as well as the career prospects. Modern laboratories, with the latest equipment, should help to make research more productive.

It will also be possible to encourage subjects that have been underfunded in the past. The population initiative is an example. But we are all aware that subjects will not advance simply because they are selected for special attention unless research workers are recruited who have novel and productive ideas. Much as organizations which fund research would like to define the direction it should take, it has proved very difficult to achieve this end.

The system

Universities are not sufficiently well funded or managed for the present time to carry out the back-up required for efficient research (*Nature*, Vol 374, 9 March 1995). The funds for this purpose are supposed to be provided from overheads, but universities also have to recognize that modern research requires a modern mechanism to administer it. The present system is wasteful and has many inefficiencies. In addition, the systems developed by the charities are still geared to a different scale and age. The charities and government agencies will therefore need to change their methods if their funds are to be used more effectively, More specifically, one can imagine the following reactions from the different organizations concerned with the management of research.

Universities

The universities may be disturbed by the imbalance in their activities caused by this major unplanned input into medical research which would not otherwise be part of their overall developmental plan.

Government

The government may have several reactions. It may decide that it need not contribute so much to medical research. It is well known that the government makes very little provision for cancer research in view of the large private funds available. If government cuts back, then growth of private funds (mainly from the Wellcome) will be negated. When private funds are available, the Government will concentrate its activities in other directions (see graph).

Will the Government cap the overhead element on charitable contributions to universities through the HEFCE? If it does so and the charities have to pay overheads to make their grants effective then the growth will have been greatly reduced.

Private funds

If the growth of the Wellcome Trust means that other charitable funds have to pay overheads, their impact will be greatly reduced. Those who collect for and administer these donor agencies may also feel less enthusiastic about the hard, often voluntary, work they put into raising funds to support research if they find their value is effectively cut by, say, 18%. They may also feel depressed by sharing their role with such a major donor which, should it enter their field, can make them look very small.

Wellcome Trust

The Wellcome Trust might feel, if it has to pay overheads to the universities, that it might be wiser to set up its own establishments and look after its own overheads and therefore control its destiny more personally. This will be very damaging to universities as it will draw away the most novel academics from the university environment, a situation that has occurred in other countries. The Wellcome Trust has hinted in its policy statement that it might extend its support in other parts of the world. Such a decision would not be very pleasing for British medical science, just at the time when it sees great resources being made available.

General points

One benefit from relatively small organizations is that they create a relationship between the donor and recipient which is pleasant and helpful. As they grow larger, such organizations become bureaucratic and more remote. This relationship provides an important role for the smaller specialized charities which can then exploit this great advantage for the research workers they help. This aspect was brought home to me many years ago when someone we had helped said to me, years later after he had become established, 'When I first started I visited the MRC and they gave me an application form. You gave me a cup of coffee!' I witness this transition with the growth of the MRC and I fear the same change might occur at the Wellcome Trust.

Independence

There is essentially only one difference between private and public funding — independence. When an independent fund grows larger than the government's, a situation arises which can result in a fear that a body that is not accountable to Parliament dominates policy. When this happens there is a tendency for the government to seek representation on the councils of the private organization. This in my view is a situation to be avoided at all costs. It eliminates the true purpose of independence. Two examples in recent years come to mind. The first was the Wellcome's decision to increase the stipend of junior research workers and trainees to encourage recruitment and indicate to the government the low status of its scholarships. The second was the Trustees' decision to support the study of the sexual behaviour of the British public against the wishes of the then Prime Minister. Would such independent action be possible today and, if so, will it be possible in the future?

Conclusion

I can sum up by saying that while I believe the intellectual capacity to grow is available in

Britain or can be available by importing talent, the infrastructure to use both private and public money is inadequate. Universities were not established to be major research institutions and if this occurs their other functions may be damaged. On the other hand, to concentrate research outside the university system may damage them even more. I think it is necessary, therefore, for the universities to examine the effect of the increased funds very carefully and redesign their administrative mechanism to cope with this influx. The overheads situation will have to be rationalized so that universities do not need to worry so much about their infrastructure. Charity can no longer expect, now it has grown so large, to be subsidized by government. But if it has to pay these costs is must see that the management structure into which it puts its funds is efficient and appropriate to the needs of research. Departments undertaking research must receive the overheads they need to do their job efficiently and not have them excessively filtered off into running the basic university educational structure. This is not a time for petty squabbles between defenders of antiquated systems. The modern mechanisms that are being used in industry must be harnessed to the universities without damaging the personal innovative capacity that is the quality of the significant research worker. Both can be done without creating a horrendous bureaucracy, but both are in danger of being lost at present. The situation will get worse with increased funds if no one thinks bigger and recognizes that, whatever the source of funds, the system must be created to develop and exploit this unique opportunity to solve some of the great problems of mankind.

The research community must therefore take up an active stance to protect this new and exciting opportunity. It will not be sufficient for it to sit back and accept the largess that is now available. Continual vigilance will now be necessary to prevent the clever manipulators of government and university funds eroding this new resource. The chance has arrived for Britain to re-attain its former eminence in medical research but to achieve this status new and imaginative approaches will be necessary. □

This article first appeared in the Summer 1995 issue of *Science & Public Affairs*, published by The Royal Society and The British Association for the Advancement of Science. Below, Peter Williams provides an update on the article.

Update

This article was written before the July re-shuffle of the Government. In the article, I tried to draw attention to some of the ways in which research can be affected when the basis of funding changes. Dai Rees [Chief Executive of the MRC, responding in the same issue of *Science and Public Affairs*] thought I had been excessively negative. Far be it from me to suggest that the growth of the Wellcome Trust has caused the government to change its policy for the management of science — that would be ludicrous. On the other hand the transfer of responsibility for science to the Department of Trade and Industry (DTI) illustrates the type of problem that can arise when decisions are taken that are appropriate for one aspect of a subject but inappropriate for another. As far as Medical Research is concerned, the moves, over many years, of responsibility from The Lord President of the Council, to the Ministry of Education, to The Cabinet Office and now to the DTI illustrates a radical change of view of the principles that govern original research. The hiving off of research for the Health Service to the Department of Health seemed a sensible move. To hive off technological development and the research it requires to the DTI also is defensible but surely there is a need for some part of government to look further ahead than the immediate future. Is the move of the MRC to the DTI the first step on the trail towards the government's abdication from the support of fundamental research? □

Women in science, unite!

An introduction to AWISE, the Association of Women in Science and Engineering, from its chair.

Joan Mason, 12 Hills Avenue, Cambridge CB1 4XA. E-mail: j.mason@open.ac.uk

It is curious how slow has been public recognition of the wastage of women's talent and training in general, and in science in particular. True, our institutions and practices date from the time when the professions were all-male. But training scientists is expensive, and few women manage to hold on to a worthwhile job as a partner's career takes precedence, and when there are pre-school children at home.

In biology, women are 60% of students, 40–50% of new PhDs, 40% of contract researchers, but only 5% of professors (and women were 42% of biology students in 1970)[1] In the physical sciences, the numbers of women in senior positions are tiny. Recent years have seen the growth of a contract research underclass[2] in which women tend to be concentrated, many dropping out because of poor employment rights. Our public funding of child care is near the bottom of the European league table. Many women cannot 'get back' after taking take time out looking after children, frequently dropping down into jobs for which they are over-qualified.

The rising tide

As for public recognition, the 1993 White Paper *Realising our Potential* noted the under-use of women's potential, and the 1994 report *The Rising Tide*, produced by a group of women scientists and engineers assembled by the Office of Science and Technology (OST), provided documentation and recommendations. The funding bodies are now working to make their provision more family friendly, producing a 'concordat' on academic careers with the universities, and supporting Returners' Fellowships, as under the Daphne Jackson scheme.[3]

The Government's Response[4] agreed to set up a small Development Unit in the OST to promote and coordinate efforts to improve the position of women. The Response also "looks forward to the work in this area of the newly formed Association for Women in Science and Engineering", AWISE, which was formed as a spin-off from *The Rising Tide*, and is now gathering strength.

Women scientists in this country — indeed in Europe — have been slow to come together for self-help or mutual help. In the USA, the American Chemical Society has had a Women Chemists Committee since 1927, and the Society for Women Engineers was founded in 1950. With the growth of the women's movement, women biologists met together across the 1960s at annual meetings of the Federation of American Societies for Experimental Biology. They felt excluded from more secure positions, from better resources, and from decision-making. In 1971, together with scientists from other disciplines, they formed US AWIS, the Association for Women in Science. AWIS and allies lobbied successfully in Washington for an Act on Equal Opportunities in Science and Technology, which passed in Congress in 1980. From this Act flowed the NSF, NRC and NIH affirmative action programs for women and minorities, in the form of research awards, visiting professorships, and so on. The Act also required the NSF to monitor progress, reporting biennially.

US AWIS now has 6,000 members and 60 chapters. In Canada, CAWIS in Ontario, SCWIST in British Columbia, and other groups, network and lobby for government programs for women. Emerging associations are WISENET in Australia, AWIS in New Zealand, SA WISE in South Africa, and TWOWS for women in the Third World. In Europe, however, WITS in Ireland is the only fully fledged organisation of this type.

In the UK the Women's Engineering Society was formed back in 1919, as women were laid off when

the men returned from the war, following a wartime agreement between the government and the unions. Women's committees were formed by the Institute of Physics and the Royal Society of Chemistry in the 1980s, as the societies observed that they were losing their women members around the age of 30, and the numbers of women surviving into the Fellowship were tiny. Women astronomers, mathematicians and others have formed e-mail networks with occasional meetings, and women in neuroscience have met together at annual meetings of the Brain Research Association. But there has been little systematic organisation of women in biology as yet. AWISE will fill a particular need for large numbers of biologists and biomedics, as well as physical scientists, mathematicians, teachers, and others working in science education, administration and the media.

Grass roots

A few of us got together to form AWISE and Anne McLaren agreed to be President (she is the Foreign Secretary of the Royal Society — indeed, their first woman Officer).[5] AWISE was launched in several places, beginning in Science Week 1994, and there are now sizeable branches in Cambridge, the Heart of England, Wessex, Oxford, Sussex and South Kensington. These have informal committees, local subscriptions, newsletters (e-mail and/or hard copy), and a range of activities: women scientists and engineers talking about their work, programmes to encourage girls to choose science and engineering, discussions of career strategies for women, mentoring, outreach into the community, and so on. Groups such as CWEST in Cornwall are adopting the role of a branch of AWISE, and others such as the Edinburgh Women's Science Forum are in liaison. Women have written in from around Scotland, from Oban, Aberdeen, Dundee and points south. AWISE Open Forum meetings have been held at the Edinburgh Science Festival in 1994 and 1995, and we are discussing with the Scottish Higher Education Funding Council and others how to develop networking north of the border.

National AWISE

Formation of the national organisation received a great boost with the provision of a well-equipped London office by the Wellcome Trust (AWISE National Office: 1 Park Square West, London NW1 4LJ; tel 0171 935 3282/5202; fax: 0171 935 0736). We now have an administrator (in the office in the mornings) who is setting up a database of potential members, and are appealing for continuing funding to industry and institutions concerned with science. Subscriptions will be low so that the membership will be representative, and so that people will belong to national AWISE and to their local Branch as well as to other societies as scientists, engineers, teachers, journalists, etc. The office will be a drop-in place for information and advice, and a centre for networking and production of the national Newsletter, which will become a quality magazine. Contributions are invited for the Newsletter, and for our Reference Library on careers, job opportunities, family-friendly measures and equal opportunities policies. 'National' meetings in London are under discussion. A recruiting leaflet is being designed for national AWISE, which the Branches will send to their members. Other who have offered to insert this in their mailings include the Wellcome Trust, which send circulars to science teachers, the Women Chemists Committee, the Biochemical Society and others.

Networking

Branch and national information goes out on the e-mail list Daphnet (write: subscribe daphnet Your Name to listserver@ic.ac.uk; for South Kensington awise, write: subscribe awise to majordomo@doc.ic.ac.uk; for Cambridge write to ucam-awise-request@lists.cam.ac.uk; for Oxford awise write to majordomo@maillist.ox.ac.uk; for Sussex awise write to awise-request@cogs.susx.ac.uk). The Office in Park Square West will soon be on e-mail (probably awise@wellcome.ac.uk). A home page for national AWISE is about to go on the Web, linking with those of the Branches, and with all other groups of women in Science and Engineering. □

References

1. Universities Statistical Record
2. *Academic Research Careers for Graduate Scientists* (HMSO, 1995), a report of the House of Lords Select Committee on Science and Technology, from the subcommittee chaired by Lord Dainton. This report describes the growth of the underclass as "maladroit administration of a valuable, highly trained, human resource".
3. Daphne Jackson Memorial Fellowships Trust, c/o Department of Physics, University of Surrey, Surrey GU2 5XH.
4. *Women in Science, Engineering and Technology*, HMSO 1994.
5. Joan Mason, *The Women Fellows' Jubilee*, Notes Rec. R. Soc. Lond. **49**, 125-140 (1995).

Neurogenesis, development and plasticity

A report on the Autumn Meeting of the BSCB/BSDB/BRA at University London, 13-15 September, 1995.

David Edgar and Iain Patten, Department of Human Anatomy and Cell Biology, University of Liverpool, Liverpool L69 3BX.

This year, the BSCB organised an Autumn Symposium with the British Society for Developmental Biology and the Brain Research Organisation in addition to the usual joint Spring Meeting with the BSDB. The reason for the participation of the BSCB in the triumvirate with BSDB and BRA stems from the rapid advances being made in the neurobiology: it seems as though neuroscientists of all bents are emerging from their apathy or disinterest to realise that the concepts, techniques and molecules thrown up by cell biology can be usefully employed in their own fields of research. Neurons and glia are, after all, cells. Symbiotically, neuroscience has occasionally arrived at the point where our knowledge of the interactions of neural cells can provide invaluable paradigms for study of the interactions of cells in general — in case you weren't aware of it, naturally occurring/programmed/apoptotic cell death in the developing nervous system has been under investigation for the best part of this century, only to burst into a plethora of non-neural tissues (and associated grant applications) in the last couple of years.

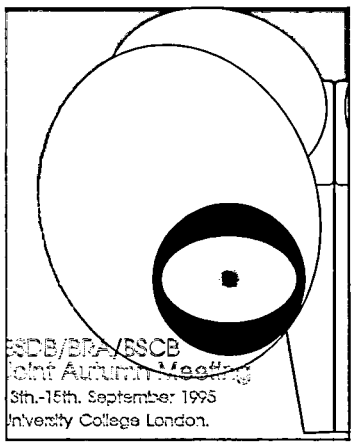
Taking these sorts of consideration into account, it seemed to the three Societies that the time was right to get together for a bit of mutual exposure and the Joint Meeting was the result. Happily, the overall opinion of the participants who managed to get into this sell-out Symposium held in the Windeyer Building of University College, London, is that it was an unqualified success — not least because of the remarkable fact that for once there were no hitches with the slide projector.

The three-day meeting consisted of both posters and talks, the BSCB being responsible for the content of the first day. In addition to the presentations of a total of 30 invited speakers, a series of 10 shorter junior presentations was intercalated into the sessions throughout the Meeting. The small and totally subjective group of topics we mention here have been selected not only because they reflect our own interests, but also because we hope that they will give a hint of the breadth of the Meeting and why we think it was successful.

The first day kicked off with a series of presentations illustrating how contemporary cell biology is having wide-spread impact on neuroscience. **Carlos Dotti of the EMBL, Heidelberg,** is associated with a laboratory that has built up a reputation over the years for the study of polarised intracellular transport in epithelial cells. Dotti has now extended this work using modifications of the techniques employed in epithelial cell model systems to show that there is a transcytotic pathway from the dendrites to the axons in neurons. Thus, in addition to the rapid relay of information in this direction by electrical signalling, a cellular mechanism exists by which the slower transfer of information in the form of macromolecules can occur. The biological significance of such a mechanism is that it may well be used to mediate specific interactions between the

individual neurons connected in any one of the many neural pathways in the brain, thus stabilising the integrity of the pathway.

Continuing the theme of neurons as polarised and compartmentalised cells, **Heinrich Betz (Max-Planck Institute of Brain Research, Frankfurt)** described the detection and discovery of the tubulin-binding protein Gephryn. As its name suggests, this peripheral membrane protein has been shown to be responsible for linking the cytoskeleton to integral membrane receptors for the inhibitory neurotransmitter, glycine. As a consequence of this link, the receptors are clustered at presumptive post-synaptic sites during development. Thus, the roles of the cytoskeleton and transcytosis in the establishment and maintenance of connectivity within the nervous system have been bought into focus for many neurobiologists who until recently would have had little interest in intracellular events.



It is surprising to reflect that in addition to the difficulty in relating intracellular structures to neuronal development and plasticity, the relevance of much of molecular neurobiology to more functional studies of the nervous system has also been obscure. Thus, the nerve growth factor (NGF), and much more recently other members of the neurotrophin family, have been under intensive investigation without any obvious link to such phenomena as learning or long-term potentiation (a mechanism by which the stimulation of a pathway in the brain facilitates subsequent signal transmission). The past couple of years has seen a breakthrough, however, with the recognition that, in addition to the role the neurotrophins have in regulating apoptosis in the developing nervous system, they play a fundamental role in the regulation of neuronal plasticity throughout life. In particular, **Hans Thoenen of the Max Planck Institute of Psychiatry, Martinsried,** discussed how the expression and release of NGF by neurons in the brain is regulated by synaptic stimulation via neurotransmitters acting on their appropriate receptors. Significantly, the release of NGF is stimulated from dendrites by what seems to be a novel mechanism whereby the entry of extracellular sodium ions across the dendritic plasma membrane evokes the release of intracellular calcium stores, which in turn stimulates the release of NGF. Significantly, these dendrites may constitute the post-synaptic sites of neurons that are able in turn to respond to the NGF by increased synthesis and release of their neurotransmitter, at least in part by a rapid increase in cytoplasmic calcium evoked by the neurotrophin. The increased amount of available neurotransmitter can then lead to the production and release of more NGF. Thus, the positive feedback arising is likely to stabilise synapses and offers a valuable paradigm for the molecular mechanisms involved in long-term potentiation (discussed by **Tim Bliss, NIMR, London)**, and hence throws light on what until now has been an operationally defined entity, the Hebbian synapse.

The clinical relevance of neurotrophins is also now becoming apparent, with the recognition that they modulate the efficacy of signal transduction. Thus **Steve McMahon (UMDS, London)**, discussed how regulation of the levels of NGF in the vicinity of sensory neuronal terminals can regulate the transmission of signals from painful stimuli. While all the details of the mechanism(s) whereby NGF increases sensitivity to painful stimuli are not fully established, it seems likely that the ability of NGF to increase the amount and release of nociceptive neurotransmitter from sensory neurons plays a fundamental role. Such observations are now leading to the design of novel therapies by which neutralisation or reduction of endogenous NGF levels may be of considerable help in pain management.

The potential clinical relevance of the neurotrophins does not stop there, however. In addition to their obvious potential use in the amelioration or reversal of neurodegeneration resulting from disease or injury, they may well find a use in conjunction with other novel agents. **Martin Schwab (Institute for Brain Research, Zurich)** described his work on the isolation and characterisation of a neurite-growth-inhibitory molecule found in association with the myelin of

the central nervous system. It has long been known that the neurons of the brain and spinal cord or not able to regenerate, and recent work from a number of groups has led to the identification of several families of molecules (including the Semaphorins) that inhibit the growth of nerve fibres. The novelty of what Schwab reported is that antibodies which block the inhibitory effect of his molecule (as yet uncloned), can, in conjunction with application of a neurotrophin (NT-3), stimulate the functional regeneration of some nerve fibres in the lesioned spinal cord of adult animals. Thus it is reasonable to suppose that the use of such therapies for the treatment of spinal cord injuries is not just a distant hope.

With regard to what's new in neurobiology that is likely to be of relevance to cell biologists in general, two presentations stand out. **Pat Doherty (UMDS, London)** described experiments linking the fibroblast growth factor receptor system to the effects of cell adhesion molecules. Such molecules, including NCAM and L1, are able to stimulate the growth of processes from neurons, and evidence is accumulating to suggest that this stimulation is not simply a consequence of their adhesivity. While there is evidence that activation of intracellular signalling pathways is responsible for growth cone migration, it is not clear how cell adhesion molecules such as NCAM activate these pathways — the functional interactions of their cytoplasmic domains (if any) are obscure. In a series of novel experiments, Doherty and coworkers have been able to implicate the FGF receptor in neuronal responses to activation of NCAM, and it may well be that there is a direct interaction between these two cell membrane molecules that leads to the phosphorylation cascade correlated with the stimulation of growth cone migration.

The role of specific adhesion between developing cohorts of cells was not forgotten, however. The elegant short presentation of **Andrea Wizenmann (UMDS, London)** demonstrated that one basis of the segregation of cells into blocks (rhombomeres) in the developing hindbrain is that there is differential adhesivity between rhombomeric neuroepithelial cells, much in the same way that Johannes Holtfreter showed differential adhesivity between the cells of different organs many decades ago.

Last (for this brief review) but by no means least was the remarkable presentation by **Chris Doe from the Howard Hughes Institute, University of Illinois.** The work of his group concerns one of the seminal problems of the biology of multicellular organisms, the mechanisms of cellular differentiation — in this case how do cells divide asymmetrically to produce two phenotypically distinct daughters? He is looking at a neuroblast in *Drosophila*, which on mitosis gives rise to one other neuroblast (stem cell) and another cell — the ganglion mother cell (GMC) — that itself goes on to divide to produce two neurons. Prospero is a transcription factor, known to be necessary for the expression of GMC genes, which is expressed in the neuroblast and is localised to the F-actin cortex of the cell. At mitosis, Prospero becomes asymmetrically localised to the 'budding' GMC, and then, following cytokinesis, it stays with the GMC, where presumably it goes on to direct developmental gene expression. Thus, it seems that the cytoskeleton, for a long time more or less the province of rather esoteric cell biological study, now finds itself at the heart of neurobiology and developmental biology. □

If you have something to contribute to the next issue of the BSCB newsletter — an article, picture, letter, cartoon, crossword, challenge, song, complaint, note, query or cover photograph — or if you have information about future meetings to be included in the listings section, please send it to: Theo Bloom, Current Biology Ltd., 34–42 Cleveland Street, London WIP 6LB. Tel: 0171 580 8377. Fax: 0171 580 8167. E-mail: theo@cursci.co.uk **by 15 April 1996.**

If you want to advertise in the Newsletter, please contact: Margaret Clements, Department of Zoology, Downing Street, Cambridge CB2 3EJ. Tel: 01223 336655.

Forthcoming meetings

Further details of the BSCB/BSDB Spring Meeting are on pages 24–29.

11–15 March 1996
The Royal Microscopical Society
Spring School in Electron Microscopy
Sheffield

18–19 March 1996
The Royal Microscopical Society
Lectins Workshop
Southampton

22 March 1996
The Royal Microscopical Society
Annual Immunocytochemistry Meeting
London

Further details from:
Royal Microscopical Society,
37/38 St. Clements,
Oxford OX4 1AJ
Tel: 01865 248768. Fax: 01865 791237.
E-mail: rms@vax.ox.ac.uk

27–30 March 1996
BSCB/BSDB joint meeting
University of York

Signal Transduction (BSCB Symposium)

Regeneration (BSDB Symposium)

Reading the Genome (BSCB Workshop)

Local organizers: S.J. Murant (BSCB),
J.C. Sparrow (BSDB)

Further details: elsewhere in this newsletter, or contact: IFAB Communications,
Institute for Applied Biology,
University of York,
Heslington, York YO1 5DD.
Tel: 01904 432940. Fax: 01904 433029
E-mail: biocomms@york.ac.uk

31 March–2 April 1996
Biological X-ray Microanalysis Group
Ions in Cells: Microscopical Measurements and Biological Activities
Cardiff

The meeting will cover techniques for studying ions in cells, from X-ray microanalysis and electron energy loss spectroscopy to ion-sensitive fluorochromes and confocal microscopy, as well as the biological significance of ions in cells. There will be main invited lectures, contributed talks and posters, and a trade exhibition.

Further details from:
Dr A.J. Morgan,
School of Pure and Applied Biology,
University of Wales College of Cardiff,
P.O. Box 915,
Cardiff CF1 3TL,
Wales.
Tel: 01222-874000 x 5872
Fax: 01222-874305
E-mail: sabcw@cardiff.ac.uk

1–3 April 1996
The Royal Microscopical Society
Microscopy of Composite Materials III
Oxford

2 April 1996
The Royal Microscopical Society
Annual Light Microscopy Meeting
London

Further details from:
Royal Microscopical Society,
37/38 St. Clements,
Oxford OX4 1AJ
Tel: 01865 248768. Fax: 01865 791237.
E-mail: rms@vax.ox.ac.uk

15–16 April 1996
The Biochemical Society and the Physiological Society Joint Symposium
Processing and Targetting of Proteins in the Secretory Pathway
University College London

15 April: V. Mankaitis (Birmingham, USA), G. Banting (Bristol, UK), D. Cutler (London, UK), G. Griffiths (Heidelberg, Germany), H.-P. Hauri, (Basel, Switzerland), S. High (Manchester, UK), and H. Pelham (Cambridge, UK).
16 April: P. Arvan (Boston, USA), B. Eipper (Baltimore, USA), W. Huttner (Heidelberg, Germany), J. Hutton (Denver, USA), G. Martens (Nijmegen, The Netherlands), D. Shields (New York, USA), G. Dockray and A. Varro (Liverpool, UK).

Further details from:
Dr David Allan,
Department of Physiology,
University College London,
Rockefeller Building,
University Street,
London WC1E 6JJ
Tel: 0171 209 6087
Fax: 0171 387 6368
E-mail: d.allan@ucl.ac.uk

15–17 April 1996
The Royal Microscopical Society
3D Imaging Sciences
Oxford

8 May 1996
The Royal Microscopical Society
Structure, Texture and Roughness
Runcorn

Further details from:
Royal Microscopical Society,
37/38 St. Clements,
Oxford OX4 1AJ
Tel: 01865 248768. Fax: 01865 791237
E-mail: rms@vax.ox.ac.uk

19 April 1996
European Tissue Culture Society Workshop
Regulation of Cell Adhesion
University College London

Topics:

- Interactions of cells with anti-adhesive and guidance molecules
- Integrin-mediated adhesion and signalling
- Influence of mechanical force on cell behaviour

Further details from:
Jo Adams
MRC Laboratory for Molecular Cell Biology
University College London
Gower Street,
London WC1E 6BT.
Fax: 0171 380 7805
E-mail: dmcbjca@ucl.ac.uk

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28 May–1 June 1996
Arc et Senans Plant Workshop
Roots
Arc et Senans, France

Sponsored by Zeneca Plant Science and Rhone Poulenc, in collaboration with *The Plant Journal*, the Workshop will provide an interdisciplinary forum to explore the subject of 'Roots'. A main feature of the Workshop will be the opportunity for young researchers and established leaders in the field of study to meet together to discuss their interests.

Further details from:
Dr Louise Dewhurst
IFAB Communications
Department of Biology,
University of York,
P.O. Box 373,
York YO1 5YW.
Tel: 01904 432920. Fax: 01904 433029
E-mail: biocomms@york.ac.uk

Items for the 'Forthcoming meetings' section of the Summer 1996 BSCB Newsletter should be sent to: Theo Bloom, Current Biology Ltd., 34–42 Cleveland Street, London W1P 6LB. Fax: 0171 580 8377. E-mail: theo@cursci.co.uk by **15 April 1996.**

2–4 July 1995
CYTO 96
The Royal Microscopical Society
Probes in Light, Electron and Digital Microscopy
Hammersmith, London

The meeting will be organized in parallel sessions:

- Life Sciences
- Materials Sciences
- Technical Lectures by the Exhibitors.

Further details from:
The Conference Officer,
Royal Microscopical Society,
37/38 St. Clements,
Oxford OX4 1AJ
Tel: 01865 248768. Fax: 01865 791237
E-mail: rms@vax.ox.ac.uk

7–9 July 1996
One day meeting, with the British Oncological Association annual meeting
University of Cardiff

BSCB organizers Chris Paraskeva (Bristol)
Prof David Thomas (Cardiff)
Speakers will include David Lane, Gerard Evan and Paul Smith.

Spring 1997
The European Cell Biology Organization Biannual Meeting

ECBO will hold its biannual meeting in the UK in 1997. The BSCB will not hold an annual meeting this year and encourages members to attend the ECBO symposium.

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28 September–1 October 1997
4th Abercrombie Meeting
Cell Behaviour
St Catherine's, Oxford University
Organizers, Gareth Jones, John Lackie,
Caroline Wigley

BSCB One-Day Meetings

Interested in organizing a small one-day colloquium on a specific cell-biological topic? The BSCB can help...

... by providing travel funds for one keynote speaker, usually from abroad, who will form a focus for your meeting. Other speakers and participants usually come from the same Institute, or from the same geographical area. A number of successful small informal groups of 20–50 people have been supported in this way, with space and facilities and incidental expenses being provided by the host Institute.

How to apply

BSCB members who wish to hold a one-day meeting on a cell biological topic should write to the Meetings Secretary. Include a tentative program, the name of the speaker to be invited, and the approximate cost of his or her travel (up to a maximum of £1,000). Please note that we will not, under this scheme, sponsor speakers in meetings that have already received funds from other sources.

Applications will be discussed at the bi-annual BSCB committee meetings, usually held in April (at the Spring meeting) and September each year. Results will be available immediately after that, and a cheque from the BSCB Treasurer made payable to the designated speaker can be sent very soon. In making the application, the organizers agree to use the money as proposed and to write a one-paragraph report on completion of the meting that can be published in the BSCB Newsletter.

BSCB/BSDB Spring Meeting

University of York, 27–30 March 1996

Provisional Outline Programme

Wednesday 27 March	Registration in the Exhibition Centre	17.00–21.00
Thursday 28 March	Plenary Lecture (BSDB)	09.00–10.00
	Symposia (BSDB) *Regeneration Growth and Pattern*	10.10–17.30
	(BSCB) *Signal Transduction*	
	Workshop (BSDB) *Green Fluorescent Protein*	10.10–17.30
	BSCB and BSDB Annual General Meetings	17.35–18.30
	Poster Session	19.30–22.00
Friday 29 March	Plenary Lecture (BSCB)	09.00–10.00
	BSCB/BSDB Symposia	10.10–17.35
	Workshop (BSCB) *Reading the Genome*	10.10–17.30
	Public Lecture	18.00–19.00
	Conference Banquet, National Railway Museum	19.30–23.00
Saturday 30 March	Plenary Lecture (BSCB)	09.00–10.00
	BSCB/BSDB Symposia	10.10–13.30

Public Lecture

Dr Gerard Evan (ICRF) will give a lecture 'What is cancer, and what are scientists doing about it?'. The lecture is open to members of the public as well as members of the Societies.

Travel to York

Leeds/Bradford Airport is less than two hours from York. A bus leaves the airport for Leeds railway station at 20 minutes past every hour; the journey takes about 50 minutes. A taxi from the airport to Leeds station costs about £11.00 and takes about 30 minutes. A direct train service is now available between Manchester Airport and York, takes two hours and costs £19.50 return. From London Heathrow take the underground to Kings Cross station. From London Gatwick take a train to Victoria Station and from there the underground to Kings Cross. There are excellent rail links to York from London Kings Cross station. Train fares from Kings Cross to York vary depending on day and time of departure. Tickets can range from £35 - £98 for a return and £34 - £49 for a single. Cheaper Apex train fares, which must be booked a minimum of seven days in advance, can be obtained if you are travelling in the UK from a location more than 150 miles from York (£35 return, £34 single). Taxis from outside York station to the University take about 15 minutes and cost around £2.50. Buses leave the railway station (Nos. 4/5) for the University every 12 minutes during the day. North Sea Ferries dock at Hull. National Express Coaches leave Hull Docks and stop in York.

Update Information

Details given here may be subject to change. Now that the Internet is used by many biologists, information on this conference will be made available and continuously updated on the World Wide Web. From 17 November, information will be accessible via the University of York's WWW server. The URL is:
http://www.york.ac.uk/depts/biol/bscbdb/meeting.html

BSCB/BSDB Spring Meeting

University of York, 27–30 March 1996

Registration Form

Name_____Dr/Mr/Ms
Address_____
_____
_____
_____
_____
Phone_____ Fax _____

Please circle details:

Society	Membership Status	Registration Fee
BSCB	Society member	£50
BSDB	Student member	£15
	Non-member	£75
	Student non-member	£30

Accommodation will be in University of York residences with a choice of standard or en-suite rooms. The banquet will be held at the National Railway Museum and is limited to the first 350. Registration includes the programme, abstracts, tea and coffee. Students have a reduced registration, provided evidence of status is supplied with this form.

	WED 27	THURS 28	FRI 29	SAT 30	TOTALS
Lunch (£6/day)					£
Dinner (£8/day)			*		£
OR Banquet* (£30			*		£
Bed and Breakfast Standard (£21.50)					£
Bed and Breakfast En-suite (£30)					£
Registration					£50 (delete £15 as £75 applic- £30 able)
Credit card charge (5%)					£
				TOTAL	£

* Note on Friday choose either dinner or Banquet

Special dietary requirements .....

Cheques should be made payable to the 'University of York'. Bank drafts IN STERLING drawn on a UK bank made payable to the 'University of York'

Credit Cards Accepted VISA ☐ ACCESS (MASTERCARD) ☐
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Number ..... Expiry Date ..... Signature .....

Return this form, and the abstract form if applicable by **31 January 1996** to: BSCB/BSDB Meeting, IFAB Communications, Department of Biology, University of York, PO Box 373, York YO1 5YW. Tel: 44 (0) 1904 432940. Fax: 44 (0) 1904 433029. email: biocomms@york.ac.uk

BSCB/BSDB Spring Meeting

Abstract Form

Abstracts from invited speakers and poster presentations will be included in the Abstract Book. Type the abstract to fit in the box below (12.5cm x 18cm) using 12 point typeface (Times Roman if possible). Title in **CAPITALS,** Authors and Addresses **in Upper and Lower Case**. Indicate authors attending the meeting with an asterisk*. Leave a line blank between the address and the text. **Please, if possible include a disk of the text, for PC or Mac, in any word-processing format but also include an ASCII (plain text) file.**

Poster boards will be 1m square. Posters to be affixed by Velcro which will be provided at the registration desk.

Please circle details:

a) Invited Speaker

or

Poster Presentation

b) Subject of Presentation*

- Signal Transduction
- Regeneration
- Cell Biology
- Developmental Biology

**Please select the category that best fits your poster presentation*

c) Eligibility for poster prize

- BSCB student
- BSDB student

Return the completed abstract form, computer disk together with your cheque (payable to the *University of York*) to:

IFAB Communications
Department of Biology
University of York
PO Box 373
York YO1 5YW

by 31 January 1996

BSCB/BSDB Spring Meeting

University of York, 27–30 March 1996

Provisional Programme

BSCB Symposium
Signal transduction

Organiser:Christopher Marshall (London)

Thursday 28 March

I. Intracellular signalling

10.10 C Heldin Yamanouchi lecture
(Uppsala, Sweden)

11.05 S Courtneidge
(San Francisco, USA)

11.40 B Neel
(Boston, USA)

12.15 A Pendergast
(North Carolina, USA)

12.45 A Ridley
(London, UK)

13.00 S Grant to be confirmed
(Edinburgh, UK)

II. Connections to the cell cycle

14.00 E Nigg
(Geneva, Switzerland)

14.35 R Mulle
(Marburg, Germany)

15.10 S Mittnacht
(London, UK)

15.50 G Peters
(London, UK)

16.25 M Doree
(France)

17.00 Short talk to be arranged

Friday 29 March

PLENARY LECTURE

09.00 P Cohen (Dundee)

III. Regulation of kinase cascades

10.10 P Parker
(London, UK)

11.15 C Marshall
(London, UK)

11.50 P Shaw
(Nottingham, UK)

12.25 L Mahadevan
(London, UK)

IV. Signalling in development

14.00 J Smith
(London, UK)

14.35 R Klein
(Heidelberg, Germany)

15.10 D Bohman
(Heidelberg, Germany)

BSCB/BSDB Spring Meeting
Provisional Programme

Saturday 30 March

PLENARY LECTURE

09.00 A Whittinghofer
(Dortmund, Germany)

V. Structural aspects of signalling

10.10 M Saraste
(Heidelberg, Germany)

10.45 M Katan
(London, UK)

11.45 I Campbell
(Oxford, UK)

12.20 J Heath
(Birmingham, UK)

BSDB Symposium
Regeneration, growth and pattern

Organiser: Vernon French (Edinburgh)

Thursday 28 March

PLENARY LECTURE

09.00	P Bryant (Irvine, USA)	Genetic approaches to the problem of cell proliferation control
10.10	J Slack (Bath, UK)	Regeneration: the final frontier of developmental biology
10.45	M Jerka-Dziadosz (Warsaw, Poland)	Genetic approach to ciliate pattern formation: does cytoskeletal organisation provide a prepattern?
11.50	S Bryant (Irvine, USA)	Regeneration: its in our hands
12.25	P Ferretti (London, UK)	Regeneration of fins and limbs and their different response to retinoic acid
14.10	G Michelopoulos (Pittsburgh, USA)	HGF as a regulator of hepatocyte growth and differentiation
14.45	V Schmid (Basel, Switzerland)	Gene expression in the life cycle and the in vitro transdifferentiation of striated muscle cells of a hydrozoan medusa

15.20		Contributed paper 1
16.05	J Ansell (Edinburgh, UK)	Title to be announced
16.40	D Winton (Cambridge, UK)	Title to be announced
17.15		Contributed paper 2

Friday 29 March

10.10	H Bode (Irvine, USA)	Homebox and forkhead genes in the patterning of hydra
10.45	E Salo (Barcelona, Spain)	Hox genes and the specification of body axes during bidirectional planarian regeneration
11.50	S Hake (Albany, USA)	Genetic control of meristem functions
12.25	S Carroll (Madison, USA)	Development and evolution of arthropod appendages
14.10	S Cohen (Heidelberg,Germany)	Cell interactions across compartment boundaries: the basis for pattern formation during limb development in Drosophila
14.45	A Hudson (Edinburgh, UK)	Dorsoventrality in leaves of Antirrhinum majus
15.20		Contributed paper 3
16.05	G Eguchi (Okazaki, Japan)	Transdifferentiation of pigmented epithelial cells as a basic process of lens regeneration
16.40	P Raymond (Ann Arbor, USA)	Role of cellular interactions in retinal regeneration in teleost fish
17.15		Contributed paper 4

Saturday 30 March

10.10	A Martinez Arias (Cambridge, UK)	The function of Notch as a receptor for wingless in Drosophila
10.45	L Dolan (Norwich, UK)	Diffusible signals in the patterning of an epidermis
11.50	P Ingham (London, UK)	Control of proliferation and patterning by segment polarity genes in Drosophila appendages
12.25	J Brockes (London, UK)	Origin and positional identity of progenitor cells in amphibian limb regeneration
13.00	M Maden (London, UK)	The role of retinoic acid in regeneration

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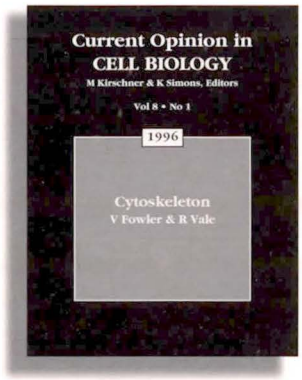
Current Opinion in CELL BIOLOGY

Editors: M Kirschner & K Simons



A complete, systematic review of the current advances in the field of cell biology. Containing recommended reading, and a bibliography of Current World Literature.

1996 Volume 8

February	Cytoskeleton
April	Cell regulation
June	Nucleus and gene expression
August	Membranes and sorting • Membrane permeability
October	Cell-to-cell contact and extracellular matrix
December	Cell differentiation • Cell multiplication

"Helps to channel the overwhelming flood of information in diverse areas of cell biology." **Dr. Sandra Schmid**

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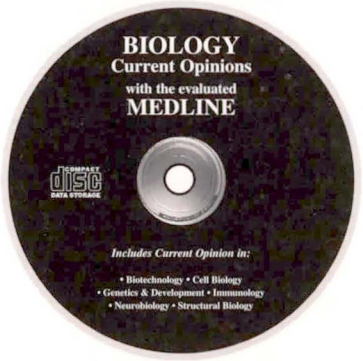

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(Please quote reference BSCB1) *Prices are for new personal subscribers only, and do not include postage.

Young Cell Biologist of the Year Poster Prize 1996

Win a trip to San Francisco

Win a trip to the American Society for Cell Biology 36th Annual Meeting and show your work.

All research students are invited to enter the next poster competition at our Spring 1996 meeting at the University of York, 27-30 March 1996 (Main symposia: Signal Transduction; Regeneration, Growth and Patterning). The prize is a trip to the USA to attend the 1996 ASCB meeting, to be held in San Francisco, December 7–11, 1996, as their guest, with an opportunity to present the winning poster.

Your poster will be judged on scientific merit and presentation by a panel of British and American cell biologists.

Please enter! Complete the form below and return it to the Secretary, Birgit Lane, CRC Laboratories Department of Anatomy and Physiology, Medical Sciences Institute, University of Dundee, Dundee DH1 4HN.

You are eligible if you are:

1. A full-time PhD student registered at a British institution
2. A member of the BSCB.

Name: .....

University and Department: .....

Year studies commenced: .....

Approximate expected date of submission of PhD thesis: .....

Address of planned post-doctoral position, if known: .....

.....

.....

.....

Date of commencement of BSCB membership: .....

Present academic address for correspondence: .....

.....

.....

Looking back and forward

The retiring President of the BSCB looks back on his period in office.

Martin Raff, MRC Laboratory of Molecular Cell Biology, University College London, Gower Street, London WC1E 6BT.

As Ron Laskey takes over from me at the beginning of 1996, it is a good time to look back on my few years as president of the BSCB. They have been a pleasure, largely because the other officers and committee members of the Society have done all of the work and have done it so well. I am very grateful to them for making it so easy for me.

The BSCB is an important and admirable society. It has almost 2,000 members and continues to grow. It organizes its own meetings and provides seed money for others. Through its Honor Fell Awards, it helps about 70 graduate students and postdocs each year to attend meetings and courses. It provides bursaries for several scientists from Eastern Europe to attend its annual spring meeting, and it publishes this Newsletter. Much of this is made possible by the generous financial support we receive from the Company of Biologists.

The Society has close links with the BSDB. The officers of the two societies meet yearly to discuss issues of common interest, and we hold our annual spring meetings jointly, which greatly increases the breadth of the meetings. There have been discussions in the past about the possibility of fusing the BSCB and BSDB, but it is hard to see how this would be an improvement on the present arrangement, which seems to serve the interests of both cell biologists and developmental biologists remarkably well.

The BSCB initiated two new events at the spring meeting in Canterbury this year. It sponsored an evening public lecture, which was given by Robin Weiss, and it organized an evening workshop where Keith Roberts discussed his experience running a network of scientists and school science teachers in East Anglia. Although the attendance at each was disappointing, at least partly because the events were not well publicized, the Committee is keen to try again and to make a public lecture and science education fixed features of the spring meeting.

The Society has still not solved the problem of the discouragingly poor attendance at the Annual General Meeting, which is held each year at the spring meeting. Even the provision of free drink and food has had little impact. It is a pity, as important decisions are often made at the AGM, and it would be helpful and more democratic to have more input from the membership. We need to make a greater effort to ensure that the AGM (and the associated free drink and food) is better publicized before and during the spring meeting.

There will not be a BSCB spring meeting in 1997, as the European Cell Biology Organization (ECBO) will be holding its biannual meeting in Brighton that year. It is hoped that most BSCB members will attend the Brighton meeting and help make it even better than the superb ECBO meeting held in Heidelberg in April 1995. ECBO hopes that a string of excellent meetings will ensure that the ECBO meetings become an established fixture in Europe, in the way that the annual ASCB meetings are in the USA.

This is an exciting time for cell biology. The molecular understanding of how cells work is advancing

at a staggering pace, and cell biology has at last taken its rightful place at the center of biomedical research and teaching. It is also an exciting time for the BSCB, which is stronger than ever before.

The main cloud on the horizon that I can see is the threat to government-funded, curiosity-driven, basic research that is posed by the strong current movement toward goal-directed and industry-linked research. It may be a passing phase, but I suspect it could be a long one. The Society may soon wish to become more politically active and speak out in various ways in defence of basic science, much as the ASCB has done in the USA.

I hope that Ron enjoys his time as president as much as I have. It is a comfort to know that, after a run of developmental biologists, a real cell biologist will be at the helm. □

Please let us know of any changes of address

Please complete the form below and send it to:

M.V. Clements, British Society for Cell Biology,
Department of Zoology, Cambridge University,
Downing Street, Cambridge CB2 3EJ, UK.

Name: ..... Sex: .....

Position: .....

Academic qualifications: .....

Tel: ..... Fax: ..... E-mail: .....

Work address: .....

.....

..... Postcode: .....

Research interests (five keywords): .....

.....

Membership of other scientific societies: .....

.....

Treasurer's report

Here are the full audited accounts for 1994. The British Society for Cell Biology

Income and Expenditure Account for the Year Ended 31 December 1994

		1994		1993
Income	£	£	£	£
Subscriptions		12,187		10,600
Mailing list		2,323		1,744
Interest		1,817		2,892
Advertisements and fliers		330		1,478
Sponsored lectures		2,400		3,400
Capitation grant (Company of Biologists		13,496		11,966
Meetings grant (Company of Biologists)		12,008		5,000
Donations (Company of Biologists)		320		0
Meetings returns		18,212		3,200
Other income		611		139
		63,704		**40,419**
Less: Expenses				
Direct Charitable				
Meetings	20,725		32,247	
Newsletter	8,052		8,069	
Membership Handbook	0		2,509	
Honor Fell Travel Awards	14,090		11,105	
	42,867		53,930	
Administration & Other Expenses				
Secretarial	651		1,244	
Committee expenses	455		432	
Subscriptions	1,525		1,480	
Postage & stationery	983		1,177	
Fax and telephone	36		32	
Bank charges	298		303	
Accountancy and Audit	258		225	
Miscellaneous	1,179		1,137	
	5,385		6,030	
Total Expenses		**48,252**		**59,960**
Surplus/ (Deficit) for the Year		**15,452**		**(19,541)**

Balance sheet as at 31 December 1994

	1994 £	1993 £
Current Assets		
Amounts Receivable	6,306	0
National Savings Bank Investment Account	28,713	27,088
Abbey National Five Star Account	5,037	4,845
Midland Bank current Account	9,221	1,634
	49,277	33,567
Less: Current Liabilities		
Creditors and Accruals	258	0
Net Assets	49,019	33,567
Financed by:		
Accumulated Fund brought forward	33,567	53,108
Surplus (deficit) for the year	15,452	(19,541)
	49,019	33,567

Approved: S. Kellie, Trustee
E.B. Lane, Trustee.

Independent Examiner's report.
We have examined the above Balance Sheet and attached Income and Expenditure Account of the British Society of Cell Biology for the year ended 31 December 1994, and certify that they are in accordance with the books and records supplied to us.

David Cooke & Co, Chartered Accountants
6 Seacourt Road, Botley, Oxford OX2 9LD.

7 June 1995

Points to note:

Total surplus for the year was higher than previously reported due primarily to a change in our accountancy procedures. Our new accountants have included the profits for all meetings held in that financial year, even if the accounts are not actually submitted until the following year. For 1994 only this means that the profits from three meetings (Autumn 1993, Spring 1994, Autumn 1994) have all been included, which has artificially increased our profit. Although we made a healthy profit in 1994, this still did not make up for our deficit in 1993. This shows how unpredictable meetings finances can be. I expect the BSCB to have a much smaller surplus for the financial year 1995. Please note that in the June newsletter the notes to the balance sheet had a"3" artificially inserted after the "£" sign which should be ignored.

Direct debits

This Newsletter contains a modified Direct Debit form which I would encourage all members who have not yet done so to complete. At the time of writing a high proportion of those members who have sent me Direct Debit forms and who have received a letter from me regarding initiation of payments may be concerned that the banks have not cancelled their previous Standing Orders. I am aware of this and I have delayed the first payment to allow you to check on whether those of you who normally pay by Standing Order in September have done so or not. **If you have sent in a Direct Debit form but the bank has still paid a standing order for the BSCB in September, I will either not extract a Direct Debit from you or I will only extract payment to make the sum up to the current subscription rates of £8.00 for students and £20.00 for others.** Bear with us as we gradually change to Direct Debit but let me know if you have any problems.

New members since April 1995

Alavi, A.L.
Alford, D.J.
Betteridge, Dr. A.
Bezbaruah, S.
Blissett, M.J.
Brook, M.
Bunney, T.D.
Campbell, L.
Carter, D.
Cartwright, Dr. T.
Church, Dr. H.J.
Clarkson, W.D.
Cole, E.G.
Coles, L.C.
Couet, C.
Croft, J.A
Dabbagh, K.
Fletcher, L.
Freeman, Dr. M.
Gibbons, A.
Grant, P.
Harris, F.
Hughes, R.G.
Hyde-Dunn, J.
James, M.
Jordan, G.
Kiernan, L.
Lax, Dr. A.J.
Lee, K.
Machesky, Dr. L.M.
McDonald, B.J.
Mcleod, L.E.
McNamee, C.J.
McNeilly, C.M.
Moss, Dr. S.E.
Murrell, Dr. A.M.
Newell, Dr. J.
Parkinson, Dr. D.
Phillips, G.W.
Phimster, Dr. B.
Pignatelli, Dr. M.
Politopoulou, G.
Pritchard, J.
Robinson, E.A.
Shah, B.
Spanswick, C.
Stoneley, M.
Wallace, Dr. V.
Wilson, R.
Wilton, Dr. J.C
Wise, C.
Xue, Dr. L.
Zhu, A.J.

Where are they now ?

Please notify the Secretary if you have a present address for any of the following BSCB members.

Adams, Dr D.H.
Al-Ani, B.S.
Alexander, Dr C.M.
Appleby, M.W.
Ashton, Dr B.A.
Ayscough, K.
Barrett, K.E.
Boocock, C.A.
Carpenter, D.
Catt, Dr J.W.
Chapman, M.J.
Chayen, A.
Collick, A.
Connolly, A.
Cooper, Dr J.M.
Cramer, F.
D'Arrigo, Dr C.
Dale, I.L.
Davies, Dr A.N.
Ferry, B.L.
Fishel, Dr S.B.
Fisher, Dr D.
Flear, A.K.
Forster, Dr S.
Gomm, J.J.
Gordon, M.A.
Guy, S.P.
Harfst, E.
Hargreaves, Dr A.J.
Harrison, Ms Cheryl
Howlett, A.R.
Idriss, H.
Imrie, Dr R.C.
Irwin, C.
John, S.
Jones, Dr B.M.
Jones, J.
Jones, P.
Lamb, J.C.
Lanham, D.F.M.
Leggett-Bailey, Prof J.
Lord, Dr P.
Lowery, Dr R.S.
Malloch, G.D.A.
Marsh, K.A.
Martignone, S.
McNamara, A.
Mee, P.J.
Meldrum, R.
Monjardino, Dr J.P.
Morris, C.B.
Morrison-Shetlar, Dr A.I.
Mota, Dr M.A.
Mowat, Dr G.N.
Nelson, Dr W.J.
Oakley, C.
Parker, E.J.
Pillidge, L.
Prinjha, Dr R.K.
Reid, A.
Rutherford, Dr T.
Sibbons, P.D.
Smith, Dr J.M.
Soto-Cruz, I.
Spencer, J.
Stack-Dunne, Dr M.
Starling, Dr D.
Staynov, Dr R.
Stenner, Dr N.F.
Thomas, C.L.
Varley, Dr J.M.
Varndell, Dr I.M.
Volkers, Dr S.A.S.
Walling, J.M.
Ward, Dr R.H.R.
Webb, P.P.
Wright, Dr E.
Zaher, Dr. S.

Honor Fell travel awards

Awards are made, up to a limit of £200, to provide financial support for young BSCB members to attend meetings. The following rules usually apply (at the discretion of the Committee):

- Awards are not normally made to applicants aged over 35
- Applicants must have been BSCB members for at least a year.
- No applicant will receive more than one award per year or 3 *in toto*.
- Applications are considered for any meetings relevant to cell biology

Applications (including a copy of the meeting registration form) should be sent to David Edgar (address on page 2) using a copy of the form below.

Application for an Honor Fell travel award

Name: ..... Age: .....

Work address: .....

.....

..... Postcode: .....

Degrees (with dates): .....

Present position (graduate students give start year of PhD): .....

.....

Date of joining BSCB: .....

Record the years of previous Honor Fell awards (if any): .....

Key publications (2) or research interests: .....

.....

.....

Meeting for which application is made (Title, place, date): .....

.....

Are you giving an invited/contributed poster/talk?: YES ☐ NO ☐ (please tick box)

If yes, give title: .....

Estimated expenses: Travel: ..... Subsistence: .....

Registration: ..... Other: .....

Have you submitted any other applications for financial support?: YES ☐ NO ☐

If yes, please give details: .....

Number of meetings attended last year: .....

Supporting statement by Head of Department:

The applicant requires these funds and is worthy of support

Name: ..... Signature: .....

Applicant's signature: ..... Date: .....

Application to join the BSCB

Please complete and return the form to:
Birgit Lane, BSCB Secretary CRC Laboratories, Department of Anatomy and Physiology, University of Dundee, Dundee DH1 4HN.

Name: ..... Sex: .....

Position: .....

Academic qualifications: .....

Tel: ..... Fax:..... E-mail: .....

Work address: .....

.....

..... Postcode: .....

Research interests (5 keywords): .....

.....

Membership of other scientific societies: .....

.....

BSCB member proposers (names and signatures):

1) .....

2) .....

Applicants without proposers should enclose a brief curriculum vitae.

Applicant's signature: ..... Date: .....

The Society does not employ professional administrators, so payment by **DIRECT DEBIT** would be appreciated (**please photocopy and fill in the form at the end of the Newsletter**). For overseas members, or those for whom this is not possible, a cheque in pounds sterling should be sent to the Secretary. Members will be responsible for renewals without reminders.

A form instructing your bank to pay your BSCB membership fees by **direct debit**, can be found on the next page. **Existing members:** if you have not already completed one, please do so, and send it to the Treasurer, Stuart Kellie, as soon as possible.

Instructions to your bank/building society to pay direct debits

DIRECT Debit

Please complete parts 1 to 6 to instruct your branch to make payments directly from your account. Then return the form to:

BRITISH SOCIETY FOR CELL BIOLOGY, C/O DR STUART KELLIE,
YAMANOUCHI RESEARCH INSTITUTE, LITTLEMORE HOSPITAL, OXFORD OX4 4XN.

To The Manager,

Originator's identification number 9 4 1 4 5 1

1. Please write the full postal address of your branch in the box above.

2. Name of account holder

.....

3. Account number

4. Sort code

Banks/Building Societies may refuse to accept instructions to pay direct debits from some types of account.

5. Originator's reference number (for office use only) **BRITSO**

6. Instructions to the Bank or Building Society

Please pay the British Society for Cell Biology Direct Debits from the account detailed on this Instruction subject to the safeguards assured by the Direct Debit Guarantee.

Signature .....

Date .....

Standing order cancellation

Please cancel any standing order payable to the British Society for Cell Biology WITH IMMEDIATE EFFECT.

Name of Bank/Building Society

Account Number

Customer's Account Name

Branch Sort Code

Signature .....

Date .....

The Direct Debit guarantee

- This guarantee is offered by all Banks and Building Societies that take part in the Direct Debit scheme. The efficiency and security of the scheme is monitored and protected by your own Bank or Building Society.
- If the amounts to be paid or the payment dates change you will be told of this in advance by at least 14 days.
- If an error is made by the BSCB or by your Bank/Building Society, you are guaranteed a full and immediate refund from your branch of the amount paid.
- You can cancel a Direct Debit at any time, by writing to your Bank or Building Society. Please also send a copy of the letter to the BSCB.

Membership fees for 1996

£20.00 **for regular membership paid by DIRECT DEBIT**

£25.00 **for membership paid by cheque**

£8.00 **for student membership paid by DIRECT DEBIT**
for those paid the equivalent of a postgraduate student grant

£12.00 **for student membership paid by cheque**

Discount on journal subscriptions

BSCB members can receive the following journals at discounted subscription rates:

	Full rate £	Members rate £
Current Opinion in Cell Biology	85.00	68.00
Current Biology	75.00	38.00
Bioessays	70.00	60.00
Journal of Experimental Biology	105.00	99.00
Journal of Cell Science	105.00	99.00
Development	140.00	130.00

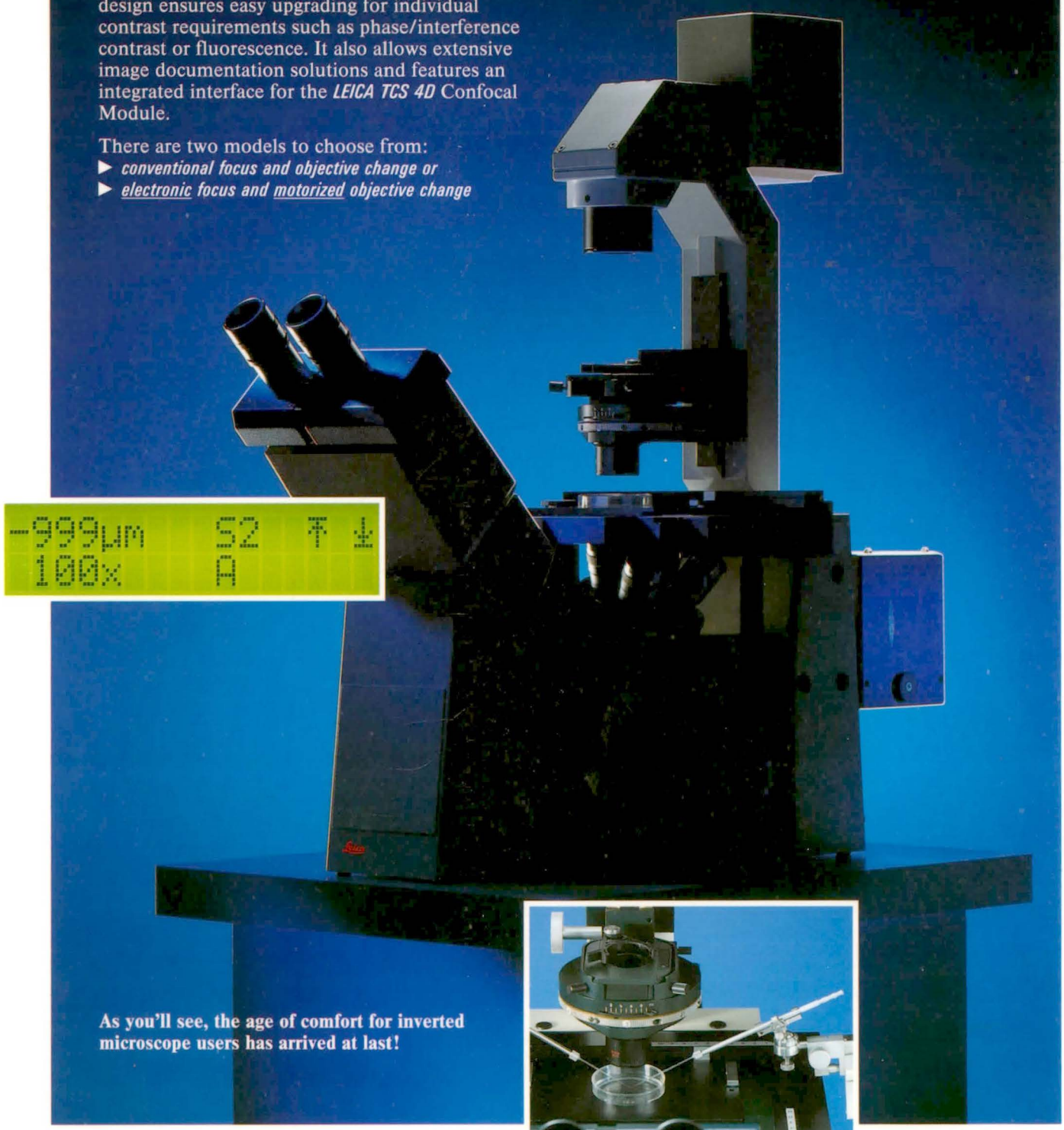
Advanced Ergonomy and Accessibility

DAS Mikroskop LEITZ DM IRB/E is an inverted research microscope that will impress even the perfectionist. Accessibility is excellent, even when several different peripherals are adapted simultaneously. **So you can fully use all the accessories you need without sacrificing operational convenience.**

As you'd expect, the thoroughly modular system design ensures easy upgrading for individual contrast requirements such as phase/interference contrast or fluorescence. It also allows extensive image documentation solutions and features an integrated interface for the ***LEICA TCS 4D*** Confocal Module.

There are two models to choose from:

- ***conventional focus and objective change or***
- ***electronic focus and motorized objective change***



As you'll see, the age of comfort for inverted microscope users has arrived at last!

LEICA UK Ltd
Davy Avenue
Knowlhill Milton Keynes MK5 8LB UK
Phone 01908 66 66 63
Fax 01908 60 99 92

Our policy of continuous development means that specifications may change without notice.

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