The Academy of Medical Sciences

Fellowship Newsletter 10

Weapons of Mass Destruction: how prepared can we be?

It is difficult to remember when a time when the phrase 'weapons of mass destruction' was not in everyday use. We are daily reminded of the dangers of possible bioterrorism. In this issue of the Academy newsletter, thanks to contributions from the Chief Medical Officer, Sir Liam Donaldson, and others, we tackle issues of public safety, effective communication of risk and the impact of bioterrorism on scientific activity.

Scientific responsibility is also at the heart of articles from Lord Walton and Professor Ian Wilmut on the subject of cloning. They address complex issues and offer personal viewpoints.

Sir Liam Donaldson, FMedSci

Without doubt, the subject of chemical, biological, radiological and nuclear (CBRN) terrorism was not the hottest topic of public discussion before the tragic events of September 11, 2001. However, since then, particularly with the anthrax cases in the United States, the anthrax hoaxes in Britain and most recently the discovery of ricin in the possession of alleged terrorists, the media have been full of stories and reports, and the whole subject has moved up the political, scientific and health agendas.

Before September 11 there was no specific public communications activity by the Department of Health on CBRN issues. Nevertheless, our specialist agencies provided general advice and guidance. For example, the National Radiological Protection Board offered information on the health effects of radioactive substances. We also had well-established and tested procedures in place for handling the communications aspects of health-related incidents.

In the aftermath of the terrorist attacks, along with all of the other activity that was taking place, we produced detailed guidance on biological and chemical materials. This was pushed out as quickly as we could to frontline staff, and was published on the Public Health Laboratory Service website (www.phls.co.uk). Together with the Department of Health's own website (www.doh.gov.uk), this now provides information for both health professionals and the public on the symptoms and treatment of specific diseases or chemical contamination resulting from terrorist activity or other incidents.

Increasingly, we have drawn on NHS Direct's emergency communications procedures, which can be activated at short notice. We have provided algorithms for issue to trained staff to enable them to assess callers to the help-line in the event of a deliberate release. These procedures were put to the test during the recent ricin incident, when, within minutes of the first public announcement, staff were ready for calls, and clear and comprehensive information was available on the NHS Direct website.

For the future, we are considering every option. We will use any sensible, appropriate method necessary to communicate information and advice to the public. If there is ever a need to issue a specific warning, we shall do so without hesitation.

During the past eighteen months, we have been increasing the capacity of the NHS to deal with the consequences of CBRN terrorism. We have bought supplies of medical counter-measures, including antibiotics, vaccines and

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Regular readers of the Academy's newsletter will have observed that this issue lacks a contribution from the Editor, Sir Alexander Macara. Sandy is currently recovering from an operation. We wish him a speedy recovery and look forward to seeing him on the front page again in the summer issue.

Professor Mark Walport, FMedSci

New Appointment

Congratulations to Professor Mark Walport on his new appointment as Director of the Wellcome Trust. Mark has worked tirelessly for the Academy since it was founded, not only in his capacity as Registrar, overseeing the annual election of Fellows, but through his many contributions to study groups, scientific meetings, careers advice and policy work.

Mark will step down from his post as Registrar at the Admission Day ceremony on 10 July. We wish him every success in his new post.

Weapons of Mass Destruction: are we reassured?

Professor Simon Wessely, FMedSci

Sir Liam Donaldson, the Chief Medical Officer (CMO), describes current health service planning in the event of a possible chemical, biological, radiological or nuclear (CBRN) incident in this country. Thanks to the hard work of CMO and his staff, particularly his deputy, Dr Pat Troop, we are far better prepared than we were two years ago. We already had in place many structures that will serve us well in an emergency - a well developed public health system, a network of public health laboratories, and increasingly advanced communication systems, which enable timely and accurate information to be rapidly cascaded down the system to every doctor in the land. A socialised medical care system may not deliver shorter waiting lists, but is probably better able to cope with the demands of an emergency than many others. As the military say, no plan will survive contact with the enemy, and should a major event happen, it is unlikely everything will go according to plan, no matter how well rehearsed. Nevertheless, the public have every reason to feel protected and reassured, as the CMO says.

And yet we are not reassured. Despite the CMO's measured words, we are drowning in a sea of government warnings of unspecified but dire events to come, amplified by a febrile media. Poison gas is imminent in our subways, ricin in the suburbs, and tanks appear in our airports. It is not just the headlines - the "op ed" pieces in our weightier newspapers are a fount of anxiety and worries. Recent Sunday papers contained several pieces about people stockpiling provisions, buying protection devices or even thinking of leaving our cities. I often wonder who these people actually are, since I have yet to meet anyone who has done any of the above, but we must assume they exist.

Something has gone wrong somewhere, and I suspect it lies in the word communication. The CMO says that there are now tried and tested procedures for handling "the communications aspects of health related incidents". True, and the Department of Health, following an initiative of the previous CMO, Sir Kenneth Calman, has been very alert to risk communication issues (*see* [1]). But even if our post-event communication is secure, what we seem unable to manage is the pre-risk communication. Indeed, the more we prepare, and the more CMO and the politicians seek to reassure, the more anxious we seem to become.

The Prime Minister talks sense about the need to inform, not alarm, the public, but actions speak louder than words. We were all alarmed by tanks at our airports, but not informed why. Ricin is found and a media hysteria is triggered. Yet ricin is not a weapon of mass destruction. Unless terrorists take to the streets in vast numbers all equipped with poison-tipped umbrellas it is better suited to covert assasination than public terror. Our messages are getting confused, and we may be sliding towards the American unhappy experience of contradictory messages. A President who tells the people to "keep shopping", whilst his Vice President is in yet another "undisclosed location", or a Congress which advises people not to panic whilst closing down half of its own facilities has not got its own risk communication sorted out. If the most powerful nation on earth cannot protect its leadership, why should the public not feel anxious and unwilling to go about their daily business?

The problem is that despite CMO's assurances, our public authorities have not mastered the techniques of reassurance. This is hardly surprising, because even in medicine we have not learnt the correct ways of reassuring our own patients[2 3 4]. We are only now coming to realise that hasty, ill conceived, or ill timed reassurance, particularly of anxious patients, may actually increase anxiety. So it is with anxious populations - when our actions fail to match up with our words, anxiety may increase rather than decrease[5] .

And if the unthinkable happens, and we are subject to a genuine CBRN attack, will the CMO and his colleagues be thanked for their foresight and careful planning? I doubt it. We live in a culture of increasing blame and fear[6]. It will not be enough that our emergency and medical systems were prepared. Once the acute danger is passed, there will be a frenzy of recrimination and searching for scapegoats. How did it happen? Who allowed it to occur? Why were we not warned? The unfair recriminations that were hurled at the FCO after their alleged "failure" to warn about the Bali bombing will be a pale imitation of what will happen if there is a CBRN incident in the UK. CMO has done his job, but the real job of politicians, media and indeed ourselves, the public - of managing our expectations, accepting risk and not indulging in orgies of blame and recrimination afterwards - has hardly begun.

Professor Simon Wessely, FMedSci, *Guy's, King's and St Thomas' School of Medicine and Institute of Psychiatry.*

1. *Bennett P. Understanding responses to risk: some basic findings. In: Bennett P, Calman K, eds. Risk Communication and Public Health. Oxford: Oxford Medical Publications, 1999: 3-19.*

2. *Channer K, James M, Papouchado M, Rees R. Failure of a negative exercise test to reassure patients with chest pain.* Quarterly Journal of Medicine *1987;63:315-322.*

3. *Howard L-M, Wessely S. Reappraising reassurance: The role of investigations.* Journal of Psychosomatic Research *1996;41(4):307-311.*

4. *Warwick H. Provision of appropriate and effective reassurance.* International Review of Psychiatry *1992;4:76-80.*

5. *Durodie W, Wessely S. Resilience or panic? The public and terrorist attack.* Lancet *2002;360:1901-1902.*

6. *Furedi F. Culture of Fear: Risk-Taking and the Morality of Low Expectation. London: Cassell, 1997.*

antidotes, and equipment to help, for example, in providing assisted respiration for casualties. These supplies have been strategically placed around the country, and, if needed, would be accessible on a 24-hour basis.

Rapid decontamination of patients can be critically important in saving their lives. The NHS, therefore now has new protective suits and decontamination units, for use by ambulance and accident and emergency staff. An essential piece of the jigsaw is education and training, and we are putting considerable effort into this area. This has involved a wide range of NHS professionals who might have to deal with the health consequences of terrorism ranging from performing decontamination to communicable disease control.

All of our planning and procurement might be to no avail if we have not tested and exercised how things work in practice. Consequently, we are testing scenarios at every level, including internationally where we are taking a leading role in Europe and wider with countries such as the United States, Canada, Japan and Mexico. The Department of Health is at the forefront of international work on risk communication and management.

Scientific Response to Terrorism

Our response as medical scientists to the threat of chemical, radiological and biological terrorism, raises a host of complex and challenging scientific, technological and ethical issues. In this brief article, I will highlight two issues, namely the imperative need for a new generation of molecular diagnostic tests for infectious diseases and secondly; the compelling requirement for scientists to establish an ethical code of conduct for research on dangerous pathogens.

The reasons for emphasising the specific issues are that the first gives a positive spin to biological terrorism that contrasts sharply with the usual profound disquiets, whereas the second is an issue which scientists must address at the peril of regulation by an outside body and of the stature of scientists being eroded in the public's perception.

Diagnosis of infectious disease and the associated characteristics of the infectious agent are fundamental steps in progressing the scientific response to terrorism. Of even greater importance to minimising the spread of terror, is the ability to differentiate a non-infected person from an infected individual. In the recent US anthrax incident, some one million persons sought medical advice reassurance at primary care centres, compared with the 23 persons who were infected. Simple tests which recognise infection as distinct from either toxicity or non-infection, and ideally which differentiate bacterial from viral infection would have profound implications for primary healthcare in general. In particular, a test for the inflammatory response (e.g. C reactive protein) or a more complex format (e.g. multiplex cytokine or TOL-receptor micro-array) would satisfy the significant need for an intermediary assay to inform subsequent triaging of the patient, as well as providing a valuable resource to healthcare, such as monitoring for post-operative inflammation or infection. It is relatively easy to profile the test required: it should be targeted for use at GP surgeries, be fast (i.e. 60min read-out), of low cost and high throughput. Such profiles fit well with the technology advances offered by genomics and proteomics coupled with state-of-art informatics. Reduction to practice can be provided only by industry, ideally working in partnership with academia. Thus, one bonus of the response to biological terrorism should be the promotion of public-private partnerships.

Initially, diagnostic tests should be targeted to those organisms (e.g. anthrax, smallpox) whose potential for generating terror is well established. Longer term the ability to genetically modify existing agents and to construct novel pathogens from known genomic sequences must be embraced. In this regard, characteristics of the infective agent is imperative; this would be ideally satisfied by having a whole genome amplification procedure which does not depend upon prior knowledge of the organism's genome.

Scientific responsibility in research on dangerous pathogens impinges upon a spectrum of fundamental issues including, most importantly, ethics, regulation and academic freedom. The principles of self-regulation are embraced by scientists who accept self-imposed precautionary guidelines, coupled with risk analysis, especially in those cases where there is a perceived danger to society or an apparent need for ethical constraints.

A pre-requisite for self-regulation is the establishment of a universally-accepted set of guidelines which, in the case of biological terrorism, would include the risks associated with contact/training foreign workers, publishing data which enables terrorism and storing dangerous pathogens. Although self-regulation is preferable, it is possible that government will not find this acceptable, in which case partnerships of government and scientists should be responsible for identifying acceptable procedures. One possible outcome is legislation. In this case, care must be exercised during the duration of the legislation to protect fully the principles of academic freedom.

A second pre-requisite is for all scientists to develop an increased awareness of the ethical issues associated with work on dangerous pathogens. Also, familiarity with the Biological Weapons Convention 2003 work plan for handling dangerous pathogens and the House of Commons Foreign Affairs Committee's recommendations for extending controls to lower categories of pathogens is crucial. Finally, compulsory vetting systems to replace current voluntary arrangements are essential. The lead role in progressing the above codes of conduct must be assumed now by professional and academic bodies.

Dr Michael Crumpton FRS, FMedSci

Dr Michael Crumpton FRS, FMedSci

Footnote:
This article draws on the Academy of Medical Sciences' written response to the House of Commons Science and Technology Committee Inquiry on "The Scientific Response to Terrorism". I acknowledge the profound contributions of the members of the working group responsible for the Academy's submission.

A major and exciting development in our health protection infrastructure is the creation of the new Health Protection Agency (www.doh.gov.uk/cmo/hpa). I announced our plans for the Health Protection Agency last year in my strategy for combating infectious diseases (including other aspects of health protection) 'Getting Ahead of the Curve'(www.doh.gov.uk/cmo/idstrategy). From 1 April 2003, it will be operational and will be vital in providing specialist support for health protection and emergency preparedness. It will be equipped to deal with a range of emergencies and will provide a unified, response nationally, regionally and locally.

The Agency will be the first of its kind in the world.

The agenda is very large and much remains to be done, but the establishment of the Health Protection Agency and its close working relationship with the Department will equip us well to deal with future challenges.

Sir Liam Donaldson, FMedSci, *Chief Medical Officer for England*

Lord Turnberg: Doctor in the House

We continue our series of Officers' profiles with this short biography of the Academy's Vice-President written by Edna Turnberg.

Lord Turnberg, FMedSci with his grandchildren

Leslie, an only child, was born in Salford. His parents were first generation British Jews with origins in Austria and Romania, and they left school early to support their close-knit families.

Although Les passed his Manchester Grammar School exams, his parents were concerned that he would have to travel on two school busses each day - so he went to the local grammar school. His father felt that the local grammar school would be good enough and how right he was! Encouraged by a biology teacher, his interest in going to University was aroused, although he would be the first in his family to enter higher education. His initial choice was pharmacy, but a chance remark by a friend diverted him to medicine. He says that it was only after he finished medical school in Manchester that he realised that it had been the right choice. He worked first in a number of hospitals in Manchester, of which the first three have disappeared.

Professor Harry Howat seemed to recognise Leslie's potential and encouraged him further. His interest in academic medicine matured late but he immersed himself in research. It was then that we met in London in 1967, (he had not much more hair then than now) and we decided within four weeks on a life together. Our first year was spent in Dallas, Texas but the pull of Manchester meant that we passed the next 25 years there. Here our children, Daniel and Helen, were born and grew up and we have all retained a soft spot for Manchester as well as the Lake District and North Wales where we have spent many happy family holidays. Manchester gave Les the chance to start up a new Department and to his surprise he found that he enjoyed the mixture of management, clinical and research activities.

He was always promising me that he would never be considered for the next job, whatever it might be, and we would be able to continue to enjoy living in Manchester. I was reluctant to move to London and, as usual, Leslie reassured me that there was no chance of him being elected as President of the Royal College of Physicians. Foolishly, I believed him; I should have known better! Perhaps his family background convinced him that he would never get to these high positions. We still keep our home in Manchester where his proud Mother (and mine) now in her 90's live, but we enjoy our lives in London. It is exciting and never dull; after 10 years we now consider London as our home. Leslie always talks of retirement, but never seems to do anything about it. He thoroughly enjoys the Lords and constantly kicks himself to realise that he is there at all. They do say it is the best club in London! So once more, Les can steep himself in something that keeps him busy and happy.

But he reserves his greatest joy for our children and grandchildren.

Edna Turnberg

Funding and Donors

Sir Colin Dollery FMedSci

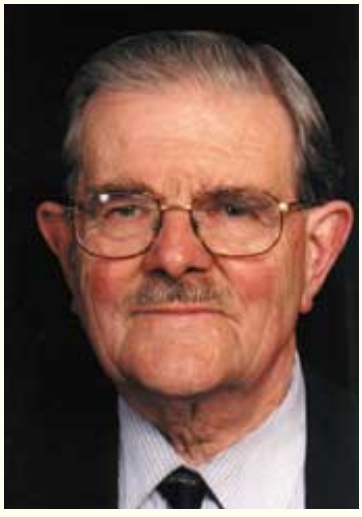
The Academy of Medical Sciences was launched into the world with some powerful assets, including tremendous enthusiasm, a very talented Fellowship and highly competent Officers. The one asset that was not included in this list was money. Fortunately some powerful friends came to its aid and had it not been for grants from charitable trusts - particularly the Wellcome Trust but also the Rayne Foundation - and generous individuals like Ralph Kohn it would not have been possible to set up the small but efficient office that has enabled the Academy to make a significant contribution to a range of topics like the supply and training of clinical academics. The founding fathers (and mothers) of the Academy had hoped that it would be possible to raise a sizeable endowment fund to help with the core costs of running the organisation, but without a track record and in a difficult national and international economic situation this proved difficult and only small sums were raised. Meanwhile the Wellcome Trust grant was decreasing each year, the short term financial outlook was quite worrying and rapid action was needed.

The first thing to do was to save money by increased efficiency. Everyone responded magnificently. A number of activities such as scientific meetings became almost self supporting out of fees and grants and the transition to an electronic process for handling Fellowship election proposals saved time and money in the Academy office. The second necessary move was to raise income from the Fellows - never a popular move by the Treasurer but essential both in its own right to help cover core costs and to demonstrate to others that we had faith in our Academy. Two steep rises in fees in two successive years is a lot and it has been a great (if painful) help but there was still a substantial gap. We were determined not to cut back on the Academy's contribution to science policy, scientific meetings and mentoring and supporting clinician scientists in training.

We are particularly grateful that GlaxoSmithKline have come to our aid with grants from the Corporate Appeal Committee and from Research and Development that will amount to £100,000 p.a. for the next 3-5 years. Special thanks are due to Dr Tachi Yamada FMedSci, head of GSK Research and Development and to John Coombe, Chief Financial Officer. Tachi has helped us in many ways over the past two years and he is a tremendous supporter of the Academy and of its mission to enhance UK biomedical science. Thanks to GSK's help and a grant from the Department of Health in support of the mentoring programme, our financial position is secure in the current financial year but further efforts are needed for subsequent years to sustain our present activities - a priority that will be energetically addressed by our new President.

Sir Colin Dollery FMedSci, Treasurer

To clone or not to clone: that is the question



Lord Walton of Detchant FMedSci

Churchill's medical dictionary defines a clone as a population of cells or organisms derived from a single cell or organism by asexual or vegetative propagation. All members of the clone possess the same genetic information and are thus almost identical with the parent cell or organism. Reproductive cloning, ie, the production by cloning of identical human individuals, is banned by law in the United Kingdom though not in many other countries. This differs from therapeutic cloning, now made possible in the UK under licence awarded by the Human Fertilisation and Embryology Authority in order to create human stem cells; these can be used for research and/or to produce cell lines which can then by modified so as to provide treatment for many human diseases. Recent press reports have claimed that the organisation 'Clonaid', established by the Raelian sect in several countries, may have produced pregnancies achieved by reproductive cloning.

One technique of reproductive cloning in an animal was first achieved by Ian Wilmut and his colleagues in Edinburgh when they created 'Dolly' the sheep. The technique involved extracting the nucleus of an ovum then inserting into its residual cell wall and cytoplasm the nucleus of another cell to be cloned, which in the case of 'Dolly' was an adult sheep udder. As Raanon Gillon pointed out in his Stevens' Lecture to the Royal Society of Medicine in June 1998 (JRSM 92. 3), the 'Dolly' type clone is not quite a true clone because the residual cytoplasm contributes the 54 or so mitochondrial genes which are incorporated into the resulting organism. Nevertheless, the vast majority of genes (more than 99.5%) in the 'Dolly' type clone come from the nucleus; hence if the nucleus from one of my cells were implanted into a cell sac from someone else, and the resulting cell was then implanted in a uterus and enabled to grow into a human being, that individual would have a gene complement almost but not totally identical to mine. However, clones created by splitting off cells from fertilised embryos would have exactly the same gene content as the embryo from which they came.

Many commentators have expressed grave concern, even horror, offence or disgust, over the prospect of human cloning, calling it 'playing God'. Others have felt that in exceptional circumstances it might be justified, when, for example, a couple wish to replace a much-loved child dying of incurable disease. Among the reasons which led the UK parliament to ban reproductive cloning were first those concerned with harm, since in the case of 'Dolly' no fewer than 277 experiments of nuclear transfer were performed before one succeeded in producing a pregnancy going to term. There is also a strong suspicion that in the present state of science, cloned individuals produced in this way might carry a very high risk of foetal malformation and/or premature ageing. Concerns have also been expressed relating to autonomy, human dignity, legal justice and the question of obeying morally acceptable laws.

On these and many other grounds, the UK parliament concluded, in my view properly, that reproductive cloning of human subjects should be banned, but that therapeutic cloning for the production of stem cells to treat human disease should, under licence and with well-defined precautions, be approved. Concerns have also been expressed about whether, if human reproductive cloning were ever to be legally permitted in any country, the so-called 'slippery slope' principle might then apply, leading to progressive potential abuse of the technique. For these and many other reasons the UK scientific community, as well as the public at large, have voiced grave concern about Clonaid's claims (which have not yet been proven scientifically). Inevitably in this, as in many other fields, press reports, often inaccurately alarmist, have damaged the public's regard for bona fida scientists, have impaired public appreciation of scientific fact and have raised the important question as to whether international legislation should be introduced to curtail the action of rogue scientists. The all-important question is as to how, if at all, any such international legislation could be approved and then policed.

Lord Walton of Detchant FMedSci

Obituaries

Dr Robert Kendell CBE FRSE FMedSci - died 19 December 2002

Professor Walter Morgan CBE FRS FMedSci - died 10 February 2003

It is with regret that the Academy records the death of two Fellows. Walter Morgan, Emeritus Professor of Biochemistry, University of London, was elected an Honorary Fellow in 2000 - the year of his 100th birthday. Bob Kendell, former Chief Medical Officer for Scotland, was a Founder Fellow, and a member of the Academy's first Council.

Mammalian cloning: the state of the art

During the five years since the birth of Dolly the sheep was announced cloned offspring have been produced in six other species by using the new procedure for nuclear transfer, although important species-specific requirements have also been identified. Offspring have been obtained from a variety of different donor cells. The procedure has proved to be reliable as it is used in many different laboratories around the world. Despite these advances the new procedure has many limitations. In particular, only a small proportion of viable offspring are obtained, regardless of variation in the procedure.

Professor Ian Wilmut, FMedSci

Clones from somatic donor cells have been obtained in cow, mouse, goat, pig, rabbit and cat. Interestingly, clones have also been produced from zebra fish. However, no offspring have been obtained from rat, horse, dog or rhesus monkey, despite a considerable research effort by experienced teams. These failures may reflect species differences in the mechanisms regulating gene expression, in early development or in the enabling techniques that are required, such as those for oocyte and embryo culture. Such differences are apparent even in those species in which cloning has produced offspring. Success in cloning rabbits depended upon modification to the procedure because of the unusually rapid entry into the first cell cycle. The pattern of demethylation of the paternal genome is different in sheep and cattle, although it is not clear that this has any influence in the cloning procedure.

Statistical comparisons between methods of nuclear transfer are made difficult by the low proportion of embryos that develop to term. Similar proportions of reconstructed embryos develop to become viable offspring, regardless of species, donor cell type or procedure (1 to 5%). Although the proportions are similar the most effective reports are five times more effective than the least. It is difficult to assess the biological significance of many reports.

Although offspring have been obtained from several different cell types, none were obtained with others. Earlier work in amphibians had demonstrated a reduction in efficiency as differentiation took place. All the present observations are compatible with that generalisation. A loss of potential has been described during two specific developmental changes. Offspring were obtained from Sertoli cells from juvenile mouse, but not those from adults. Similarly, potential was lost during the final differentiation of neurones. It is formally possible that offspring derived from primary cultures are mostly or entirely obtained from stem cells within the source tissue because no experiment has been described to assess this possibility.

In addition to embryonic loss, somatic cell nuclear transfer is also associated with very high rates of fetal, perinatal and neonatal loss, and production of abnormal offspring. Not all of these effects are due solely to nuclear transfer as similar problems are reported following embryo culture. Typically, at least a third of the cattle and sheep confirmed pregnant with cloned embryos, lose their fetuses during gestation. Many cloned offspring die within the first 24 hours of birth. Common anomalies include respiratory distress, increased birth weight and major cardiovascular abnormalities that can result in gross distension of the liver and dilated major vessels. There has not been an adequate assessment of post natal development of clones. Abnormalities that have been described include failure of the immune system, structural abnormalities of the brain, digestive dysfuntion, enteritis and umbilical infections.

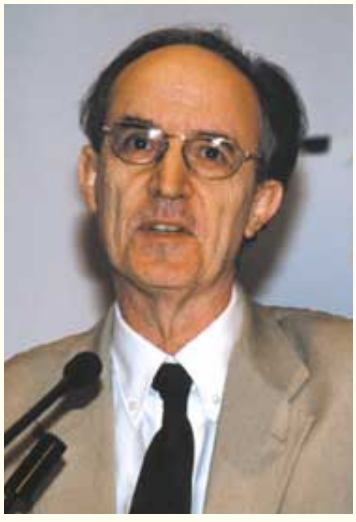
There is now increasing direct evidence to support the hypothesis that the unusual occurrence of death during development is a result of inappropriate expression of genes whose effect may be lethal at different stages of development. An extraordinary amount is asked of the oocyte when the nucleus is transferred from a differentiated adult cell into an enucleated oocyte. The nucleus of the donor cell is organised for tissue specific function. It is assumed that a large part of this organisation must be erased after nuclear transfer before remodelling of chromatin and nucleus to ensure normal development. The changes must be brought about by an oocyte that evolved to receive sperm chromosomes that are packed primarily in protamines, whereas chromosomes in the transferred nucleus are packed in somatic histones.

In view of the consistency of results in different species there is every reason to expect that should anyone attempt to produce a cloned child the outcome would include late abortions, the birth of dead children and of children that were alive but not able to survive.

Professor Ian Wilmut, FMedSci, Department of Gene Expression and Development, Roslin Institute

Recent Academy Events

Evolution And Disease



Professor Mel Greaves FMedSci

This Academy meeting, held on 6 December 2002, addressed the intriguing topic of Darwinian medicine. This new discipline has as its central theme the idea that an evolutionary perspective can inform our understanding of why we are vulnerable to common diseases and the rationale of some disease symptomology. The event, organised by Academy Fellow Professor Mel Greaves (Institute of Cancer Research, London) and Dr Randolph Nesse (University of Michigan), brought together an eclectic range of speakers and an unusual audience mix of evolutionary biologists, medical researchers and clinicians. Lord Turnberg opened the meeting on behalf of The Academy. The topics discussed included the impact of infectious diseases (Weatherall, Stearns, Weiss), cancer (Greaves), foetal/maternal conflicts and imprinting (Hurst), ageing (Austad), and diet and disease (Eaton). Dr Nesse, co-author with the evolutionary biologist George Williams of the landmark book in this field: *Why We Get Sick,* provided a lucid description of the principles of Darwinian medicine in terms of imperfect body engineering and trade-offs in design. Abstracts for all of the presentations are on the Academy's website at www.acmedsci.ac.uk

A major objective of the meeting was to disseminate the central ideas of Darwinian medicine more widely and, in particular, to seek to persuade practising physicians and those responsible for medical curricula that this topic merits a place at the high table of medical training and practice. The conference provided a boost to this agenda.

A lively discussion was generated, orchestrated in the final session by the evolutionary biologist Richard Dawkins with presentations from a practising pathologist/physician, John Lee, a developmental biologist, Lewis Wolpert and a medical historian, Bill Bynum. There was considerable interest from the media with follow-up articles and broadcasts in the scientific and popular press and overall the meeting was judged to be a great success.

The Academy thanks the following for supporting the meeting: The Institute of Cancer Research, The Kay Kendall Leukaemia Fund and The Kaplan Foundation (New York)

Professor Mel Greaves FMedSci

Are Endocrine active chemicals bad for your health?

The topic of endocrine disruption by chemicals in the environment has been investigated by many scientists in recent years. It has been the subject of analysis by government organisations and professional bodies such as the Royal Society and the International Union of Pure and Applied Chemists. The media has also considered the topic newsworthy, although statements and portrayal of the data have not always accurately reflected the scientific evidence. Studies in wildlife, particularly aquatic species, certainly suggest that a range of chemicals have adverse effects on reproductive development. Evidence from epidemiological studies suggest changes in sperm counts and quality, and rates of testis cancer, undescended testes and hypospadias, has led to an assumption that the same mechanism applies to humans.

Professor Ieuan Hughes FMedSci

This topic was chosen by the Academy of Medical Sciences for a one day interdisciplinary meeting which took place on 24 January 2003 at the Moller Centre, Cambridge, with the aim of critically evaluating the evidence for harmful effects of endocrine active chemicals in humans. A tall order which realistically was not going to lead to all the answers. Nevertheless, champions in this field of biomedical science rose to the challenge to produce an informative and thoughtful summary of the current state of the science. Abstracts may be found on the Academy's website. The concept of a Testicular Dysgenesis Syndrome which underlies the male reproductive tract abnormalities seems to be gaining credence - as proposed by Professor Neils Stakkebaeck; Dr Richard Sharpe now appears to have developed a rat model of this syndrome by manipulating the chemical environment during maternal exposure.

Toxicological studies are bedevilled by problems of critical dose thresholds, low dose effects and cumulative effects from multiple sources. Endocrine disruption is not spared this problem, yet the meeting heard honest, open discussions by experts in these studies such as Dr Andreas Kortenkamp, Dr Paul Foster and Dr Larry Needham. The latter tantalisingly gave a foretaste of an impending report by the National Center for Environmental Health of exposure studies in the US population of a large number of chemicals in the environment. The success of a meeting can be judged by the degree of audience participation of which there was plenty on offer. The wide range of professionals, including Fellows, who attended representing several medical and scientific disciplines and stakeholders is also a good marker - and encouraging for the aims of the Academy.

I am particularly indebted to Richard Sharpe who jointly planned the scientific programme, to Susan Wicks at the Academy and to the Society for Endocrinology and Astra Zeneca for additional support.

Professor Ieuan Hughes FMedSci

Forthcoming Events

Monday 31 March at 17.00: Forum launch
Designed to promote and increase the interaction of academic and industrial biomedical scientists and engineers, the Academy of Medical Sciences Forum will be launched by Lord Sainsbury at 10 Carlton House Terrace. Dr Allen Roses will deliver a lecture on *Pharmacogenetics and personalised medicine.*

Tuesday 3 June at 09.00: Forum symposium on the European Clinical Trials Directive
Examining the practical implications of the Directive, to be implemented in the UK in a year's time, this symposium will be chaired by Professor Alasdair Breckenridge FRSE FMedSci. Taking place at the Royal College of Pathologists, speakers include Dr Brian Davis, Steve Hasler and Dr Moira Daniels.

Tuesday 1 July at 17.00: Academy of Medical Sciences Sackler Lecture
The inaugural event in a new lecture series endowed by the Raymond and Beverly Sackler Foundation will take place at 10 Carlton House Terrace. Professor Marc Tessier-Lavigne FRS will talk on *The logic and molecular mechanisms of axonal guidance, branching and regeneration.*

Thursday 10 July at 14.00: Admission Ceremony
Fellows of the Academy are encouraged to attend the admission ceremony of newly-elected* Fellows taking place at the Royal Institution. A full programme of scientific presentations and a reception will follow.
** announcement of names in Newsletter no. 11 and via email to Fellows in mid-April*

Thursday 20 November at 14.30: Annual meeting and Dinner
Taking place at St Bartholomew's Hospital: *details to be confirmed.*

Thursday 11 December at 18.00: Jean Shanks Lecture
Professor Michael Bishop will deliver the third Jean Shanks lecture. *Venue and title to be announced.*

Awards and Prizes

Congratulations to Fellows recognised in the New Years Honours...

Knight Bachelor: Professor Sir Ravinder Maini,
Professor of Rheumatology,
Kennedy Institute of Rheumatology, Imperial College - services to rheumatology.

CBE: Professor Michael Clarke,
lately Professor of Epidemiology,
University of Leicester -
services to public health medicine.

CBE: Professor Thomas Lehner,
Professor of Basic and Applied Immunology,
Guy's, King's & St Thomas' Hospital School of Medicine -
services to oral immunology and dental health

... and to Fellow Professor Karmiloff-Smith, recipient of the European Latsis Prize for her contribution to the understanding of cognitive and language development in children with genetic disorders.

The Academy of Medical Sciences was established in 1998 to act as an authoritative body to promote medical science across traditional boundaries. The Academy campaigns for better structures in support of the medical sciences, promotes excellence in research, provides scientific advice, encourages better communication of medical science and provides quality services to its Fellowship. The Academy draws its authority from its elected Fellowship of 700 leading medical scientists in the UK who may use the suffix FMedSci. The Academy Officers are Sir Keith Peters FRS (President), Lord Turnberg (Vice-President), Sir Colin Dollery (Treasurer) and Professor Mark Walport (Registrar).

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