

ISSN 0965-1128

The Endocrinologist

THE NEWSLETTER OF THE SOCIETY FOR ENDOCRINOLOGY • ISSUE 93

AUTUMN 2009

EDUCATION SPECIAL ISSUE



PLUS

Society grants
update

Free online access
for members



► **Buzzwords:** *'interdisciplinary', 'innovative', 'integrative'*. These get attention. In grants they help get the dosh; in manuscripts they improve the chances of publication. Is this because of a deeply *entrained* Pavlovian expectation, with the reviewer's score destined to be higher than if these words were absent? Or is this a reflection of the inherent, and possibly even self-evident, virtue of broad-ranging approaches to science, ones that also capture the imagination? Education, dissemination of knowledge, and grants are key themes of this issue.

Endocrinologists excel at integrative approaches in science and clinical practice, but there can be few examples as cross-cutting as the recent performance of *The Tide Tables* (see page 16). A Wellcome Trust-supported venture, this was a highly novel approach using a stage production to interrogate the biology of mid-life, whilst educating (without lecturing) about endocrinology. Saffron Whitehead (past Editor of this newsletter) was deeply involved in the project, providing the endocrinological input to the artistic flair. If you have the chance, the website link gives video insight into what it was all about, which, perhaps, may inspire fresh approaches to education about our subject.

No less successful in public engagement, however, was the more traditional lecture-based approach delivered by Steve Franks in Oxford on 'How hormones shape your life'. It is yet another example of the external collaboration activities of the Society, this time with Science Oxford, and you can read more about it on page 15. The 'young ones' are also 'doing it for themselves', with the Voice of Young Science (part of the charity Sense About Science) running workshops for early career scientists in media training and communication of science. These explain how best to mitigate against the misrepresentation and hype that are all too common - Emma Ross reports on page 8.

On page 6, we find the Endo Train has steamed on to Bristol. Stafford Lightman gives a superb *tour de force* of the history and vast depth and breadth of endocrinology and diabetes in that city. This is the third stop in this series, and several other centres have made contact to arrange for the train to call on them - it could also be your chance, just let us know.

The Society is extremely generous in its grant and award-giving activity. The Young Endocrinologists Prize Lecturers, Georgia Papacleovoulou and Tom Barber, tell us the background to their excellent lectures presented at the BES in 2009 on page 13. On pages 10-12, the numerous recipients of other grants give short reports on their work, hopefully whetting the appetites of members to apply in the future.

This year also saw another highly successful undergraduate essay prize competition, with 55 entries. In his winning essay, Adam Hexter considers the true cost of the 'credit crunch', an excerpt of which appears on page 14. Meanwhile, fostering careers sees further development in 2009, and Joy Hinson reports on the activities of a new committee on page 15.

Finally, Hotspur (page 18) has clearly been in a reflective mood, and from his creative garret comes a philosophical muse on matters of audience participation and behaviour. Perhaps it is time for a change in the *modus operandi* when we come to course evaluation?

JOHN NEWELL-PRICE



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Company Limited by Guarantee
Registered in England No. 349408
Registered Office as above
Registered Charity No. 266813

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2009 Advertising

For more information, contact
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Deadline for news items for the Winter 2009
issue: **9 October 2009**. Please send
contributions to the above address.

Free online journal access for members

► From 2010, all members of the Society for Endocrinology will have access to the most up-to-date research published online in *Journal of Endocrinology*, *Journal of Molecular Endocrinology* and *Endocrine-Related Cancer* automatically with their membership.

Access to the journals will be gained via the BioSciAlliance website, a new portal designed to enable you to manage your membership effectively (www.bioscialliance.org). This superb new benefit of membership will allow you to search the literature and follow logical pathways in research through reference-linking to and from other journals in the field.

Print subscriptions will continue to be available as an option for members, at the lowest available prices.

New Council members needed

► Professor Kevin Docherty, Dr Rob Fowkes and Professor Mike Wallace will retire from Council in March 2010, having served their 4-year terms of office. A further position will be left vacant when Professor Graham Williams becomes Treasurer on 1 January 2010.

Full members are requested to make nominations to fill these four vacancies. A nomination form is included with this mailing or can be downloaded from www.endocrinology.org/about/committee/council.html. To provide the correct balance on Council, the Society is seeking three basic science members and one clinical member to fill the vacancies. The deadline for nominations is 11 December 2009.

Re-election of Officers

The Society's Officers must offer themselves for re-election in their second and subsequent years of office. The current post-holders are Julia Buckingham (Chairman), Paul Stewart (General Secretary) and Márta Korbonits (Programme Secretary), who are entering their second year of office.

If any member wishes to propose an alternative name for any of the above posts, please contact Julie Cragg (julie.cragg@endocrinology.org) by 2 November.

Benevolent Fund

The Trustees of the Benevolent Fund of the Physiological Society would like to draw members' attention to the Fund. It exists to help anyone who 'by the nature of their employment can be considered to have contributed to the advance of physiology' and who is in 'necessitous circumstances'. For more details see www.physoc.org/site/cms/contentCategoryView.asp?category=404.

Send your suggestions for Society BES 2011

The Society welcomes scientific suggestions for the 2011 Society for Endocrinology BES meeting, for consideration by the Programme Committee. If there are any sessions you would like to see included, please submit them by the end of January 2010 through www.endocrinology.org/meetings/ScientificSessions/index.aspx.

Prize draw winners

In June, we held a prize draw of members who had completed a direct debit mandate for payment of membership subscriptions. The prize was a £50 Amazon voucher, which was won by Dr R Almohammed from Scunthorpe General Hospital.

A second prize draw of all the respondents to our membership questionnaire was won by Dr C Capatina from Bucharest, who also received a £50 Amazon voucher.

Congratulations

The Society is delighted to announce that Professor A Dell (Division of Molecular Biosciences, Imperial College London) was awarded a CBE for services to science in the Queen's Birthday Honours List. We also congratulate Professor Mike Wallace, who has been made a visiting Professor at the University for Strathclyde, Institute of Pharmacy and Biomedical Science, Professor Joy Hinson, who has been made Professor of Endocrine Science at Queen Mary University of London and Dr Waljit Dhillon, who has been made a Reader in Endocrinology & Metabolism at Imperial College London.

SOCIETY CALENDAR

2-4 November 2009

Society for Endocrinology Clinical Update
Renaissance Manchester Hotel, Manchester, UK

4 December 2009

Society for Endocrinology Regional Clinical Cases Meeting
Edinburgh, UK

23 February 2010

Society for Endocrinology National Clinical Cases Meeting
London, UK

15-18 March 2010

Society for Endocrinology BES 2010
Manchester Central Convention Centre, Manchester, UK
Abstract deadline: 16 November 2009

New members

We are pleased to welcome the new members approved by Council in May. There are 35 from the UK, and 3 from the rest of the world.

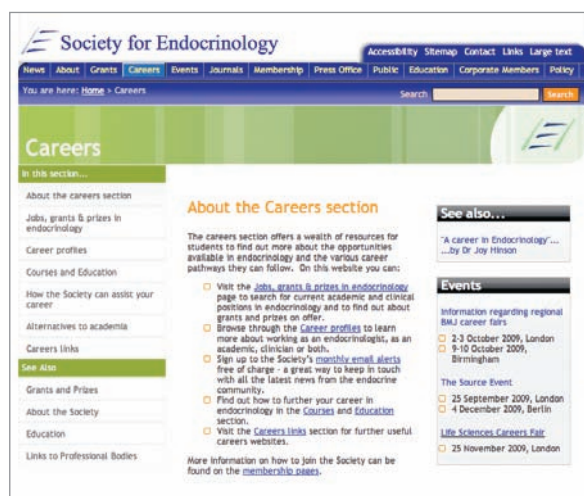
WITH REGRET

We are sorry to announce the deaths of Senior Members Professor P Krohn and Professor R Coupland, and Full Member Dr K MacLeod (whose obituary appears on page 4).

Updated careers website

► The Society's careers web pages have had a makeover. Visit www.endocrinology.org/careers for the latest jobs, grants and prizes in endocrinology, to browse through the career profiles, or to search for a Masters or short course in endocrinology. If you have a vacancy available in your department, please send us the details to careers@endocrinology.org. We'll publicise it free of charge on the site.

And while you're browsing the careers pages, make sure you don't miss the new section 'A biomedical basis for life - alternatives to academia'. We'll be posting a selection of career profiles from endocrinologists who have chosen alternative science careers. Do you know anyone who has left academia to pursue an alternative career? If so, we'd like to hear from them. Please forward their contact details to careers@endocrinology.org.



Society of Biology

The Privy Council formally approved the revised Royal Charter in July, allowing integration of the Biosciences Federation and Institute of Biology to form the Society of Biology from 1 October 2009. All members of the organisations have become members of the new Society.

Prof Dame Nancy Rothwell is the first President, Dr William Marshall the Honorary Treasurer and Prof David Coates the Honorary Secretary. The Chief Executive Officer had been appointed but not announced when *The Endocrinologist* went to press.

The Interim Council forms the basis of the new Council, with a managed transition of existing members to the new profile of elected and appointed members from the two colleges (organisational and individual). Council members are to be elected by the new Society's membership.

It is important that members contribute their views, ideas and questions about the Society of Biology. Find out more at www.newbio.info. Send any comments by email or by adding to the blog: <http://newbioinformation.blogspot.com>.

Tell us your news!

Have you been contacted by the press? Are you going to be interviewed by a radio station or appear on the television? The Society's Public and Media Relations team is keen to hear from members who are working with the media. Please let us know of any upcoming interviews at media@endocrinology.org, so we can publicise them to the membership.

OBITUARY

KENNETH M MACLEOD

► To be an outstanding endocrinologist you need to be a true all-rounder. Kenneth MacLeod was a rare doctor who excelled as a specialist endocrinologist, general physician, teacher, researcher, and academic leader. He will be greatly missed after his tragic death aged 46 on 11 July 2009.

Ken qualified in 1986 from Aberdeen Medical School and then trained in general medicine, hypoglycaemia research, diabetes and endocrinology in Aberdeen and Edinburgh. His talents were rapidly appreciated when he moved south to Exeter, and in 1996 he was appointed as a consultant endocrinologist.

He was a leading researcher and national authority on hypoglycaemia in diabetes, and served on the Secretary of State's Advisory Panel on Driving and Diabetes. His research always asked important questions and he was not afraid to publish findings that went against the prevailing dogma.

Ken was a wonderful, enthusiastic educator for patients, students and junior and senior colleagues. He played a leading role in establishing the Peninsula Medical School and was the Associate Dean for Exeter. As Director of Clinical Studies he ensured the new curriculum never lost sight of the key knowledge and skills a young doctor needed.

Ken MacLeod was the dedicated doctor we all would like to be. He had one priority - his patients - and was never happier than during a busy clinic. Even in the face of increasing medical school and national responsibilities he refused to cut down his clinical commitments in endocrinology, diabetes and general medicine. Clinics were reorganised into any available time slot to make sure he could see his patients!

Ken was an inspirational leader and had great vision. He masterminded the setting up of the new Diabetes, Endocrinology and Vascular Health Centre at the Royal Devon and Exeter Hospital. It was his determination that ensured that the new Peninsula Medical School building had a crucial extra floor added to accommodate researchers.

His great personal warmth pervaded everything he did. He was not just the brains of the Exeter Diabetes and Endocrinology Department but also the heart. We will greatly miss his wonderful ability to help people feel confident and genuinely valued.

He was a committed family man and is survived by his wife and three children.

ANDREW HATTERSLEY

Paying fees for open access publishing: towards a strategic response

► Have you had difficulty in getting hold of funding to make your paper open access? Although many funders, and indeed now even some institutions, insist that you make your published paper free to all within a short deadline, it's not always clear how you are to pay the 'author-side' fees needed to make free-to-view publication viable. Universities UK has published a report to tackle this important question.

Some mandating bodies have not made the connection that their mandates have funding implications, perhaps imagining that making copies of articles freely available on open repositories has no repercussions for the journals upon which they depend. There are others which have clearly budgeted to provide these funds but, even then, it is not always clear to authors how they can get hold of them via their institutions. Only a very small number of UK higher education institutions currently have any clear arrangements in place.

UUK's report, published jointly with the Research Information Network, seeks to address these concerns by setting out guidelines for the key stakeholders. The Society's staff (Sue Thorn and Steve Byford) were active participants in drawing up the report. The Biosciences Federation has also endorsed it.

The report recommends the following:

- HEIs should each set up a dedicated budget to pay author-side open access publication charges.
- Funding bodies should clarify how they will provide support for researchers to meet their open access policies, especially regarding the payment of open access fees.

It also suggests that authors should make use of resources such as the Biosciences Federation's *Authors' Guide to UK funders' policies on Open Access*, and

familiarise themselves with their funder's policies and the arrangements within their institution. Publishers are asked to give clear advice to authors on their open access requirements and on the associated fees.

If the report's recommendations are followed, it will represent an important step towards a joined-up approach to open access, and help remove the corrosive effects of unfunded mandates.

STEVE BYFORD

FURTHER READING

Paying for open access publication charges (Report of Universities UK and the Research Information Network) www.rin.ac.uk/openaccess-payment-fees

Authors' Guide to UK funders' policies on Open Access (Biosciences Federation) www.bsf.ac.uk/journals/journals_authors/guide.htm

Society for Endocrinology policy on self archiving on institutional and other repositories www.endocrinology-journals.org/misc/archiving_policy.dtl

New Chair for BBSRC

The formal appointment of Professor Sir Tom Blundell FRS FMedSci as the new Chair of the Biotechnology and Biological Sciences Research Council (BBSRC) was announced on 18 June 2009 by the Department for Business, Innovation and Skills.

Results: SCE in Endocrinology and Diabetes

A total of 39 candidates sat the first diet of the Specialty Certificate Examination in Endocrinology and Diabetes in May 2009. The overall pass rate was 38.5% with 64.3% of the UK trainees passing the examination. For further information visit www.mrcpuk.org/SCE/Pages/Results.aspx.

new from oxford

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Oxford Handbook of
Endocrinology and Diabetes
Second edition
by Helen Turner and John Wass

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for SFE members

This unique pocket guide to endocrinology and diabetes has been fully revised for the new edition. Written in conjunction with the *Oxford Textbook of Endocrinology and Diabetes*, it covers clinical investigation and management of both common and rare conditions, and includes the protocols and explicit clinical information necessary for the management of individual patients with endocrine and diabetic disorders.

Society for Endocrinology members can receive 20% off the cover price. Please visit www.oup.com/uk/sale/websocsf for information and how to purchase.

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THE ENDO TRAIN

all aboard for... **Bristol**

Stafford Lightman greets us as we disembark for a tour of endocrinology in the south-west's largest city.



► **Bristol was always one of the great port cities of the UK - and the second greatest trading city after London in the 18th century. It was ideally located to develop trading links with Europe, Africa and the American 'Colonies', and became rich from activities related to the slave trade, wine, spirits and tobacco. Not, perhaps, an auspicious ethical starting point for 21st century biological science, but important history that must not be forgotten.**

But Bristol's place in history is also reflected by Isambard Kingdom Brunel's legacy - the SS Great Britain, the Clifton Suspension Bridge, and one of the world's first railway stations. We have the replica of John Cabot's ship, *The Matthew*, to remind us of his voyage to North America from Bristol in the 15th century. And then there are Concorde, the BBC Natural History Unit, Bristol International Balloon Fiesta, Wallace and Gromit, and Banksy, a local street artist whose activities are renowned worldwide.

Endocrinology - and in particular neuroendocrinology - also has a long history in Bristol. Hans Heller was appointed lecturer in charge of the newly created Department of Pharmacology in 1942, became Professor of Pharmacology in 1949 and developed an internationally renowned centre for research on the regulation of the neurohypophysis. His symposia on 'The neurohypophysis' in 1956, 'Neurosection' in 1961 and 'Subcellular organisation and function in endocrine tissues' in 1970 attracted endocrinologists from all over the world.

Barry Cross, a protégé of Geoffrey Harris, was Professor of Anatomy from 1967 to 1974, and developed the technique of electrophysiology in the hypothalamus. He trained, amongst others, Richard Dyball, John Morris, Dennis Lincoln and Richard Dyer. Meanwhile, Brian Pickering's MRC unit moved to the Department of Anatomy following Hans Heller's retirement and continued the excellent work on understanding the regulation of neurohypophyseal secretion.

The opportunity for me, as a neuroendocrinologist, to come to such an excellent university with such a marvellous history in endocrinology was one I could not resist. I came from Charing Cross and Westminster Medical School with my clinical scientist colleague, Andrew Levy, who was soon joined by David Wynick and Colin Dayan, as well as our basic scientific colleagues Chas Chowdrey, Michael Harbuz and David Jessop. We moved to an area of refurbished laboratories in what had been dermatology wards around the back of the Bristol Royal Infirmary (BRI). These were exciting times and we were soon joined by superb basic scientists including David Murphy, Craig McArdle, James Uney, Nola Shanks, Christopher Lowry, Stephen Lolait, Anne-Marie O'Carroll, Hans Reul, Astrid Linthorst and Kei Cho.

After moving around the bowels of the BRI several times, we obtained a Wellcome Trust SRIF Award, which, with a grant from the HEFCE and support from the University, allowed us to build the Dorothy Hodgkin Building, which now houses the Henry Wellcome Laboratories for Integrative Neuroscience and Endocrinology. This has transformed our ability to perform integrative research from the most basic cell biology through to physiological studies and clinical translation.

Clinical endocrinology has expanded over the whole of the Bristol campus. In the BRI, my own research group works on the HPA axis, especially its regulation in health and disease. We have been particularly interested in the regulation of the ultradian pattern of cortisol secretion and how this regulates gene transcription. These *in vivo* and *in vitro* studies are now being applied to translational work in man, with potentially very important implications for steroid therapeutics, including a new understanding of the inadequacy of current steroid replacement regimens.

Andrew Levy is an internationally renowned authority on the pituitary gland and the aetiology of the development and maintenance of pituitary tumours. He has shifted the previously held paradigms on their causes and his concept of 'exuberant normality' remains the best conceptual understanding of cell activity in these fascinating tumours.

David Wynick has focused on the role of the neuropeptide galanin in neuropathic pain and neuronal protection. He is translating his work into preclinical drug development funded by a Wellcome Trust Seeding Drug Discovery Award, and most recently has started a research out-patient clinic in Bristol, focused on improving the management of diabetic neuropathic pain.

Colin Dayan's interests cover both the thyroid axis and the immunotherapy of type 1 diabetes. He runs the joint thyroid eye clinic at Bristol Eye Hospital and is the principal investigator in the multicentre combined immunosuppression and radiotherapy in thyroid eye disease study, in close collaboration with Moorfields Eye Hospital and four other centres in London. His unit has also conducted the largest trial of combined T4/T3 therapy in the world, and has made fascinating progress in identifying common genetic variations that effect thyroid hormone action.

Together with Susan Wong and Mark Peakman (King's College London), he has collected 650 adult cases with newly diagnosed type 1 diabetes for immunological studies and has conducted the first phase 1 trial of peptide immunotherapy. Also, with Rob Andrews, he has established the early ACTID randomised controlled trial of intensive diet or intensive diet and exercise versus usual care in newly diagnosed type 2 diabetes. He runs our insulin pump clinic and, with Richard Smith, the regional pancreas transplant programme.

Susan Wong joined us from Yale University and has a major research focus on the immunopathogenesis of type 1 diabetes. She is interested in the role of CD8 T-cells, B-cells

and innate/adaptive immune interface in the pathogenesis of type 1 diabetes. Her work in animal models is carried out in parallel with translational development of immunotherapy for type 1 in collaboration with Colin Dayan.

Rob Andrews, a senior lecturer in our department, has developed one of the country's largest medical obesity clinics at Musgrove Park Hospital in Taunton. Last year saw over 1400 referrals and more than 400 surgical procedures. They have now been made lead centre in the south-west as an international centre of excellence for bariatric surgery. This programme importantly has a large research portfolio looking at the effect of weight loss and surgery on gut hormones and insulin secretion, signalling and sensitivity.

We have been fortunate in the appointment of Karin Bradley as full-time NHS consultant endocrinologist. With a DPhil in molecular endocrinology from the University of Oxford and extensive clinical experience, she has helped to optimise care for patients with multiple endocrine neoplasia and other rare genetic endocrine syndromes. She has developed a regular monthly neuroendocrine tumour multidisciplinary team at the BRI, which attracts referrals from across the south-west of England.

Karin is also the endocrinology representative on the steering group investigating service delivery for 'late effects' patients living in the Peninsula region, and is helping to establish a co-ordinated local clinical service for these survivors of childhood cancer. Her interests and roles include endocrinology in a critical care setting and endocrine disorders during pregnancy, as well as diabetes care and general medicine. She has recently been joined by a second NHS colleague, Bushra Ahmad.

The University Hospitals Bristol NHS Foundation Trust (UHBT) also has an extremely active paediatric endocrine programme. It has one of the UK's largest obesity services, run by Julian Hamilton-Shield, and one of the UK's largest paediatric diabetes services, with an emphasis on research into rare forms of diabetes, neonatal diabetes, Down's syndrome and autoimmunity.

Julian in particular has been the driving force behind the discovery of 6q imprinting anomalies in neonatal diabetes, KCNJ11 mutations causing neonatal diabetes and the discovery of genes involved in neonatal glucose metabolism, PTF1A1, ABCC8, HNF4 alpha and GLUD1 mutations and the cause of neonatal hyperinsulinaemia. Collaborative studies with Jeff Holly have focused on insulin resistance in obesity, including studies on adipocytes with respect to adipogenesis and insulin resistance. Liz Crowne is Chair of the British Society for Paediatric Endocrinology and Diabetes, and her research has concentrated on the late effects of cancer treatment on endocrine systems.

Reproductive endocrinology is led by David Cahill and Andrés López Bernal. David's focus is on the endocrine status of serum and follicular fluid and its relationship with successful *in vitro* fertilisation. His data suggest differential regulation in patients with minor degrees of endometriosis. Andrés concentrates on CRH and oxytocin signalling in the normal and pregnant myometrium and the abnormalities that occur in premature labour.

In north Bristol, Edwin Gale and Polly Bingley lead a major diabetes research centre. They have developed the current model for predicting future onset of diabetes in

close relatives of an affected child. This led on to ENDIT (1994-2003), a multinational intervention trial. Their interest in the epidemiology of type 1 diabetes has led to a close collaboration with Kathleen Gillespie, studying the role of NK cells in autoimmune diabetes and immunogenetic characterisation of diabetes in Down's syndrome. Edwin played a prominent role in the early stages of the EURODIAB ACE network which has greatly clarified trends in the epidemiology of childhood-onset diabetes in Europe. He is Editor of *Diabetologia*.

Jon Tobias works on metabolic bone disease, with a particular interest in the pathogenesis and management of osteoporosis. Through the unique 'Children of the nineties' birth cohort, we are gaining important insights into the factors which affect skeletal development in childhood, such as maternal vitamin D exposure, fat mass, and a variety of genetic influences. Jon helps lead a nationwide study characterising the phenotype and genotype of individuals with extremely high bone mass, which has provided further evidence of an important link

between obesity and bone metabolism. Through the COSHIBA study, he is examining whether a new clinical tool can identify patients with undiagnosed vertebral fractures. He has a strong local interest in steroid-induced osteoporosis, exemplified by randomised controlled trials examining the role of bisphosphonates in preventing bone changes following steroid therapy for inflammatory bowel disease and multiple sclerosis.

Jeff Holly was one of the first scientists to realise the importance of IGFs and he has been an active leader in the International Society for IGF Research. He played a major role in working out the inter-relationship of GH, IGF-1 and their metabolic effects, and now works closely with epidemiologists at the Department of Social Medicine in Bristol, studying a variety of large population cohorts to examine how metabolic and hormonal status relate to the development and progression of chronic diseases, particularly the hormone-dependent cancers.

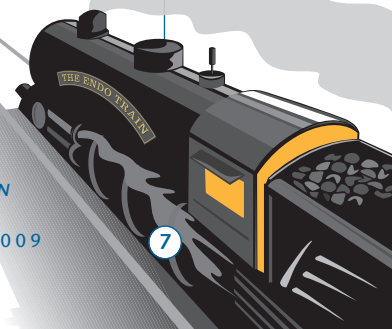
Overall, there is a wealth of clinical and basic scientific expertise and activity in Bristol. With the proposed merger of the UBHT and the North Bristol NHS Trust, we expect even greater integration of research activities. We anticipate considerable development of the translational studies in the neuroendocrine and metabolic areas, and the synergies of the numerous research groups and our colleagues in Cardiff and the Peninsula will ensure Bristol remains a major hub of novel research and endocrine clinical development.

Please visit our websites
(www.bristol.ac.uk/clinicalsciencesouth/hwline,
www.bris.ac.uk/clinicalsciencesouth,
www.bris.ac.uk/clinicalsciencenorth,
www.uhbristol.nhs.uk, www.nbt.nhs.uk),
and if anyone is interested in discussing research activities with us, then you are of course very welcome.

STAFFORD LIGHTMAN



Dorothy
Hodgkin
Building



Standing up for science

Emma Ross found a Voice for Young Science at a recent media workshop - and suggests you do the same.

► There is huge public appetite for finding out about the latest scientific discoveries and how they might affect how we live our lives. But all too often this science becomes sensationalised or misrepresented in the media, which can, at very least, misinform or give false hope and, at worst, damage attitudes towards the medical profession and cultivate the use of unproven, sometimes dangerous, alternatives.

Sense About Science is a charity which works with scientists to promote good science and evidence for the public, and their Voice of Young Science (VoYS) programme aims to help early career researchers stand up for science in the public domain (see www.senseaboutscience.org/VoYS).

VoYS held another of their successful media workshops last June in London. These workshops aim to give early career researchers an insight into and understanding of how science is portrayed and communicated in the media, and what they can do to get involved and prevent misrepresentation.



The workshop opened with a session on the role of science and scientists in the public domain, and what happens when facts are distorted or discussions become polarised. The media-savvy panel gave the audience an excellent insight into how to work successfully with the media.

Dr Robin Lovell-Badge, Head of the Division of Developmental Genetics at the MRC, relayed his experiences of the media coverage of his work into sex determination in mice (cue lots of humorous tabloid headlines) and stem cell research. His scientific expertise in such topical issues has led to him be frequently called into news studios as their 'expert scientist'. He emphasised that in these situations you have very little time to get your key message across, and can easily get led off track by the journalist. His advice was to identify two or three key points that you want to get across, and make that your sole aim of the interview. If the questions don't fit those key messages, 'bridge' to make them fit.

Catherine Collins, Chief Dietician at St George's Hospital, talked about the challenges of dealing with pseudoscience communicated by unqualified individuals. Although 'dietician' is a protected title, anyone can be a 'nutritionist', and Catherine highlighted how celebrities and laymen alike have jumped on this bandwagon and now give what is portrayed as 'scientific' advice, which is rarely evidence-based. She emphasised the importance of challenging the scientific credentials of such people, or such claims, and recommended using blogs and internet forums to get your side of the story across.

Professor Mark Enright, Professor of Molecular Epidemiology at Imperial College London, has also had his fair share of media exposure, particularly in relation to



the MRSA stories. His message was that if you work with the media you can use them to your advantage, but to be aware of their tendency to extrapolate unrealistically: the functional consequences for humans of results from a lab bench are often predicted too quickly.

The next session comprised a well-balanced panel of journalists from *The Sun*, BBC and *Nature*. All raised the issue of the strict deadlines that are imposed, which reduce the time available for fact-checking and contacting the key scientists involved in the research. Whilst the panel all had strong science backgrounds, this is not always the case, and it was evident that journalists are at the 'mercy' of their subeditors, who often don't have much experience of science.

The panel also emphasised their need to make a story entertaining and engaging for the public, which often involves simplifying facts, or allowing the story to be 'sexed up' a little! Their advice was to ensure you have a really good press release, as this is will be the source of most information for their article. This means keeping it simple and understandable, and being explicit about why this science is novel or unique.

The day was rounded off by a Sense About Science panel talking about the opportunities for early career researchers to get their voices heard in debates about science, and how to respond to bad science when you see it. In addition, Lucy Goodchild, from the Imperial College Press Office, spoke enthusiastically about getting to know your press officer, and letting them help you disseminate your research findings to a wider audience. The main message from this panel was that there are not enough young, enthusiastic, early career scientists getting involved with the media, yet these are exactly the sorts of people the media would love to have representing science. So, go for it!

I found the workshop very helpful as it gave me an all-round perspective of science and the media, from the scientists who have extensive experience of their work being disseminated into the public arena, to the journalist whose job it is to convey it responsibly, via the press officers who can make the difference between a good and bad media experience.

I would recommend the VoYS media workshops to any early career researchers who either find their own work attracting media interest or simply have an interest in responsible dissemination of science in the media today.

EMMA ROSS

To find out more about VoYS workshops and projects, contact Julia Wilson at voys@senseaboutscience.org or see www.senseaboutscience.org. The next 'Standing up for Science' media workshop takes place in Edinburgh on 6 November.

Grants and awards 2009

► Welcome to this special section on the Society's grant and award activities. As many of you know, the Society has been able to increase the budget for these activities considerably. They include Early Career Grants (previously termed Small Grants), Summer Studentships and support for conferences, laboratory and clinical department visits.

Following the success of our grant and award schemes, we have launched this annual update of the awards made during the year, reports from some of the recipients, and just some of the positive feedback we have received from Society events.

Thank you for all the comments you have supplied via forms and email in the past year. It really helps us mould our meetings better and match awards to members' needs.

For information about all the Society's grants see the website at www.endocrinology.org/grants. The next deadline for the Early Careers Grant will be 27 November 2009.

ALAN MCNEILLY, GRANTS PANEL CHAIR, SCIENCE COMMITTEE CHAIR

Reports on the Patient Support Grants will be published in the next issue.

AWARD WINNERS

Early Career Grants (formerly Small Grant Programme)

We congratulate the following successful recipients of awards made under the Early Career Grant programme after the May 2009 deadline:

- Lesia Kurlak (Professional Unit of Obstetrics and Gynaecology, University of Nottingham), awarded £9621 for 'Placental selenoproteins' iodothyronine deiodinases expression and activity in normal and preeclamptic pregnancies'
- Laura Matthews (Department of Medicine, University of Manchester), awarded £9680 for 'Investigating Gc sensitivity in meiosis'
- Nicole Reisch (School of Clinical and Experimental Medicine, University of Birmingham) awarded £10 000 for 'Analysing protein degradation of 21-hydroxylase as a novel approach towards an improved understanding of the molecular pathogenesis of congenital adrenal hyperplasia'
- Kirsty Smith (Department of Investigative Medicine, Imperial College London) awarded £6621 for 'Augurin, a novel regulator of the hypothalamo-pituitary-adrenal axis'
- Emily Thompson (Department of Investigative Medicine, Imperial College London) awarded £9814 for 'Do inherent differences in leptin sensitivity predict age of pubertal onset and propensity to become obese?'

Postgraduate Essay Prize Competition

The Society's new essay competition was launched earlier this year. Made available to members and non-members alike, it is open to all students registered for a higher degree in the UK or Ireland at the time of essay submission (e.g. a Masters course or research degree such as MPhil/PhD/MDRes or equivalent). Full details can be found at www.endocrinology.org/grants/prize_postgraduateessay.html. The winner of this year's competition will be announced in a subsequent issue.

Summer Studentship Winners 2009

The following departmental applications were accepted and awarded grants in May 2009:

- Institute of Biomedical Research, University of Birmingham
- Queen's Medical Research Institute, University of Edinburgh
- Laboratory of Molecular Signalling, Babraham Institute, Cambridge
- School of Clinical and Experimental Medicine, University of Birmingham
- University of Algarve, Faro, Portugal

Undergraduate Achievement Award 2009

These awards are to encourage excellence in the study of endocrinology by undergraduate students by providing a 3 year grant for departments to use as they see fit to recognise outstanding undergraduates.

The following each received an award for £300 per annum for 3 years, following the 17 July 2009 deadline:

- Department of Physiology, Anatomy and Genetics, University of Oxford
- School of Life Sciences, Kingston University, London

Overseas conference grants

December 2008 deadline: 129 awarded, 9 declined
April 2009 deadline: 57 awarded, 8 declined

CORPORATE SPONSORS

We take this opportunity to thank all our corporate sponsors for their generous support, which enables the Society to offer many of their grants to fund endocrinologists at all stages of their careers. For more information about the Society's corporate sponsors, see www.endocrinology.org/corporate.

GRANT REPORTS

Lab Visit Grant Report 2009: 11 β HSD1 and glucocorticoid production in adipose tissue

► My clinical and laboratory studies focus on the enzyme 11 β -hydroxysteroid dehydrogenase type 1 (11 β HSD1) and its contribution to glucocorticoid production in adipose tissue. This grant enabled me to spend a period of time at the Oxford Centre for Diabetes, Endocrinology and Metabolism (OCDEM), where I worked under the supervision of Dr Fredrik Karpe. The purpose of my study was to measure 11 β HSD1 directionality across human subcutaneous adipose tissue *in vivo*.

Over the past 2 years of my PhD in Edinburgh, I have developed and validated a new method to measure glucocorticoid inactivation *in vivo* using a stable isotope tracer (d2-cortisone). The aim was to use this new stable isotope tracer along with an established cortisol tracer (d4-cortisol) to measure and compare glucocorticoid (cortisol and cortisone) generation across two metabolically important tissues, subcutaneous abdominal adipose tissue and muscle. In addition, we aimed to assess the effects of hyperinsulinaemia on enzyme activity and directionality.

Arterio-venous (AV) sampling across adipose tissue allows the measurement of abdominal adipose glucocorticoid production. This technique was developed by Keith Frayn and colleagues in Oxford. So, the purpose of my visit was to learn this technique and apply the new tracer method I had developed, to better understand glucocorticoid generation in these tissues.

This project also provided me with the opportunity to learn other clinical research techniques, e.g. adipose biopsies, that I will be using in future studies in Edinburgh.

Although the plasma samples and blood flow data from this study are not yet processed, I hope that the results from this project will lead to published papers and presentations at local and national scientific meetings. Furthermore, information from this study on the regulation and activity of adipose 11 β HSD1 will provide clinically relevant information for the 11 β HSD1 inhibitor drug-development programmes.

I am grateful to the Society for Endocrinology for the Lab Visit Grant towards this project, allowing this first substantive collaboration at both sites. I am also grateful to the staff and volunteers in Oxford for their invaluable help with this study.

KATHERINE HUGHES

'A very inspiring conference academically for a junior trainee like myself'

'This meeting was, as usual, superb. Good mix of basic and clinical science. Plenary sessions were of both clinical and scientific interest/relevance'

'All excellent plenaries. Provided a nice mix of science and clinical endocrinology which was stimulating and useful'

comments from recipients of Society BES 2009 travel grants

Sponsored Seminar Grant 2008: Integrated mechanisms of cellular identity and homeostasis

► The Babraham Institute in Cambridge celebrated 60 years of science with an International Diamond Jubilee conference on 26 and 27 June 2008. The programme comprised top international speakers, including several former Babraham Institute scientists (Azim Surani, Robert Feil, Nullin Divecha, Brigitta Stockinger and Steve Jameson).

Research interests at Babraham have clearly evolved considerably over the past 60 years. The study of endocrinology has been a key feature of the Institute's remit, and the themes of the conference reflected the main areas that have led from this - signalling, development and immunology. The event brought together international leading researchers in epigenetics and signalling to explore two convergent themes embracing these topics: epigenetic mechanisms in development, and cellular responses to the environment. These themes evolved from the Babraham Institute's vision of the future need for integrative approaches both inside and outside the nucleus.

The Institute has a long-standing reputation as a signalling centre of excellence. Recently several signalling groups have begun a collaborative drive to combine their respective strengths using a systems biology approach. So the 'cellular responses to the environment' component focused on large-scale integrative strategies for understanding cellular signalling, bringing together several leading scientists who are applying systems biology approaches to complex signalling questions. These included Kevin Shokat (chemical genetics of protein kinases), Anjano Rao (genome-wide human and *Drosophila* RNAi screens identifying novel signalling regulators), Dennis Bray (systems biology pioneer, mathematical modelling of signalling pathways in bacteria), and Julian Downward (genome-wide screening of critical growth regulators in human oncogenesis). They were complemented by Gita Stockinger and Steve Jameson (T-cell homeostasis in health and disease) and Doreen Cantrell (integration of serine kinase signalling pathways).

The Institute has also become a world-renowned centre for epigenetics, with eight groups working on genomic imprinting, DNA methylation, chromatin remodelling, non-coding RNA transcription, and genome-wide nuclear organisation. 'Epigenetic mechanisms in development' embraced the 'hot' topics in epigenetics and epigenomics. Talks included the epigenetic factors and processes that control stem cell programming and genomic imprinting (Azim Surani, Robert Feil, Austin Smith, Yehudit Bergman, Mandy Fisher), higher order chromatin structure and dynamic nuclear organisation of the genome (Wendy Bickmore, Tom Misteli), roles of DNA methylation in health and disease (Adrian Bird, Robert Feil), and X chromosome inactivation (Edith Heard).

Several speakers spanned both themes (Nicholas Spitzer, genetic programming and calcium signalling in neuronal stem cells; Anjana Rao, chromatin regulation of lymphocyte commitment; Nullin Divecha, cytoplasmic and nuclear phosphoinositide signalling).

The conference attracted 170 internal and external delegates, and also included a poster session, with short talks chosen from delegate abstracts. The Society for Endocrinology generously contributed to this meeting and the funding enabled Babraham to support the attendance of graduate students and young post-doctoral scientists at a considerably reduced cost, for which we are very grateful.

JENNY PELL

Small Grant 2007: Stress threatens early pregnancy by altering prolactin signalling

► Stress threatens early pregnancy by its effects on the hormone secretion and cytokine balance (Th1:Th2 ratio) required to maintain feto-maternal interface integrity. Stress decreases secretion of progesterone, in association with miscarriage/spontaneous abortion. However, the neuroendocrine mechanism linking stress perception to decreased hormone secretion is not known.

Progesterone secretion is maintained in early pregnancy by gonadotrophin secretion from the pituitary and trophoblast/decidua including, importantly, prolactin, and hCG. Uterine prolactin expression is a marker for decidualisation. We hypothesised that in early pregnancy stress profoundly reduces prolactin expression and secretion when compared with virgins.

We analysed prolactin secretory responses to stress in normal pregnant mice and in a mouse model of pregnancy failure, and the underlying neuroendocrine (i.e. inhibitory dopamine) mechanisms. We found that immune stress (LPS), psychological stress for 24h or fasting for 24h all decreased prolactin secretion in early pregnant mice. In the mouse model of pregnancy failure prolactin decrease was more profound than in C57/Bl6 mice. Increased activation of hypothalamic dopaminergic neurones was revealed by double immunocytochemistry, suggesting increased dopamine activity. Therefore, relevant hypothalamic responses to stress are enhanced and can explain the stress-induced inhibition of prolactin.

Furthermore, increased expression of tyrosine hydroxylase mRNA (the enzyme that generates dopamine) was increased with stress. However, in mice that were susceptible to pregnancy failure, expression responses were different, indicating that in this model other hypothalamic mechanisms interact with the stress effects. Data on prolactin expression in the pituitary and decidua are not yet available, and are still being optimised. In association with decreased prolactin, stress increases pregnancy-threatening cytokine expression (e.g. IL6) more in early pregnancy than in virgin mice, so there may be a cytokine/stress interaction which could compromise pregnancy maintenance.

We are now building on these data to characterise other neuroendocrine responses to stress in early pregnancy, including their role in controlling prolactin secretion.

We thank the Society for Endocrinology for helping to fund experiments to address this research. The research has formed the basis of a grant application already submitted to the MRC. The grant provided lab consumables for a PhD student for a year and strengthened external collaborations with the new co-applicant on the submitted grant. On this basis I have also been invited to speak at an international conference.

In addition to the direct benefits to the grant holder and the PhD student, the student has subsequently received other funding to travel to the collaborator's lab to learn new techniques, which we now intend to set up and develop in Edinburgh. This supports the Centre for Integrative Physiology's aim to integrate different approaches to further our understanding of physiological systems. The PhD student involved in the project experiments has joined the Society for Endocrinology.

ALISON DOUGLAS

Small Grant 2007: Adenosine nucleotides in communication between osteoclasts and osteoblasts

► I am grateful to the Society of Endocrinology for their generous support, which has further developed my on-going collaboration with Dr Bronwen Evans (Child Health, Cardiff University) on the role of adenosine nucleosides in the communication between osteoclasts and osteoblasts.

A student undertaking laboratory training with us showed that expression of the A2a and A2b adenosine receptors increased as osteoclastogenesis progressed. Human osteoclast proliferation also significantly increased ($P < 0.05$) when mononuclear cells were differentiated *in vitro* in the presence of adenosine (10^{-4} M). On the other hand, incubation with both human and rat osteoclast-conditioned medium caused MG63 (osteoblast-like) cells to significantly decrease in number. These osteoblasts, however, showed an increase in alkaline phosphatase activity (a marker of differentiation). Intriguingly, the opposite results in relation to cell number (i.e. an increase) and alkaline phosphatase activity (i.e. a decrease) were obtained with the more differentiated SaOS-2 osteoblast-like cell line. These studies are on-going.

Part of the funding was used by our joint PhD student to finish some studies on the adenosine regulation of mesenchymal stem cell differentiation to osteoblasts and adipocytes. These latter investigations have been presented at various national meetings including the annual meetings of the Society for Endocrinology and the Bone Research Society. They are currently being written up for publication and, together with our preliminary studies on osteoblasts and osteoclast communication, will form a basis for applications for external funding.

This Society for Endocrinology grant has clearly helped the Centre of Endocrine and Diabetes Sciences, and me in particular, to continue and expand the work on adenosine and nucleotide signalling. The grant has helped to generate findings that have initiated collaboration between departments and schools, an interdisciplinary approach which is strongly supported by Cardiff University.

JACK HAM

Summer Studentship 2008: An investigation into the functional mechanism of AIP

► Germline mutations were identified in a gene in the 11q13.3 region encoding aryl-hydrocarbon receptor (AhR)-interacting protein (AIP) in patients with familial pituitary adenomas and occasionally in sporadic cases. The 330-amino acid AIP is a molecular chaperone protein, involved in the functional maturation of AhR, an orphan nuclear receptor known to bind the environmental toxin dioxin.

My laboratory has so far published functional data on the effect of wild type and mutant AIP protein on cell proliferation and protein-protein interaction and on the expression and cellular location of AIP in both normal and adenomatous pituitary tissue. We showed that over-expression of wild type AIP slows down cell proliferation in three different cell types, including a pituitary cell line. We also showed that the mutations disrupt this function and also the protein-protein interaction between AIP and its known interacting partner, PDE4A5. Additionally, we described the cellular distribution of AIP in normal pituitary cells and showed its exclusive association with GH and prolactin secretory vesicles. Though we showed that AIP slows down cell proliferation we don't know the specific mechanisms/pathways through which it acts.

During this Summer Studentship, the student (Sophie Hollington) investigated the potential role of AIP in the apoptosis pathway. For this investigation, GH3 and HEK293 cells were transfected with wild type AIP, mutant AIP and empty vector. After 24–48h a luminescent caspase 3/7 assay was carried out on the transfected cells. The effect of AIP on the cell cycle proteins was also investigated. GH3 and HEK293 cells were transfected with wild type and mutant AIP. Successful transfection was confirmed using a myc-tagged antibody on Western blot. Western blotting was used to investigate the expression of p27, p16, p18 and cyclin D3, comparing the cells over-expressing wild type AIP and empty vector as well as wild type and mutant AIP.

The apoptosis results showed that the effector caspase (3/7) activity is significantly increased in cells over-expressing wild type AIP compared with empty vector, and also that this effect is partially lost in cells over-expressing the mutant AIP. This was shown to be the case in both the pituitary cell line (GH3 cells) and HEK293 cells. No conclusive results were found with the cell cycle protein expression and AIP over-expression, because of time taken to optimise the antibodies, variable transfection success, and other factors. However, one preliminary result suggests that phosphorylated p27 expression is reduced when wild type AIP is overexpressed.

In conclusion, AIP exerts its tumour suppressor role, at least to some extent, via apoptosis. Further work on upstream caspases would provide more understanding of this potential mechanism. An abstract has been entered into the Barts and the London Medical School William Harvey Day and the RSM Students' Group Research Presentation prize, and is planned for submission to the next Society BES meeting later this year as a result of the work completed during this Studentship. We are very grateful to the Society for this support.

MÁRTA KORBONITS

Summer Studentship 2008: 11βHSD1 inhibitors in atherosclerosis

► The Society's Studentship allowed me to carry out 10 weeks of very enjoyable and interesting research into the role of 11βHSD1 inhibitors in atherosclerosis at Queens Medical Research Institute, University of Edinburgh.

I was able not only to increase my knowledge of the scientific approaches, but also to learn some very valuable laboratory skills, such as chromatography and real-time PCR. Before the project I had never carried out any *in vivo* work, but now I feel I can handle and use animals effectively in any future experiments. The time period allowed me to take time to thoroughly develop the methods. I have gained considerably more experience in presenting data and preparing reports of experimental findings, and some of the generic skills in computing are already benefiting me in my assignments in my undergraduate studies.

I also enjoyed working with fellow members of staff on the projects and learning how to plan and manage my experiments. I was able to attend research talks and institute symposia, and really enjoyed being part of that environment. I hope to present my work at a conference for medical students aimed at promoting research careers in undergraduate medicine (ATRIUM), where I will gain experience in preparing a poster and discussing my work. I took the opportunity during the summer to discover the possibilities of studying for a PhD, and was advised on the approach to take to put myself in a competitive position when the time comes.

Overall, it was an immensely valuable experience which I will recommend to others. I shall keep in contact with my supervisors and I hope to submit an essay for the Undergraduate Essay Prize around the topic in the spring. I also hope to have the opportunity to attend the Society BES meeting next year when the studies are complete and being presented.

KATIE SULLIVAN

'We are very grateful for this funding. I think the recipient has particularly benefited. In a very short time she has gained confidence in the lab and is now able to design well-controlled experiments. As part of the experience I asked her to make the first draft on which this report is based'

comment received with Summer Studentship 2008 grant report

'This Undergraduate Achievement Award is an excellent idea. It will enable us to further raise the profile of endocrinology in the undergraduate course, and will help us to persuade the best students of the attraction of a career in this field. We are most grateful to the Society for the opportunity to do so in this way'

comment received with Undergraduate Achievement Award grant report

'Prized' lectureships

► After completing my first degree in molecular biology and genetics in 2004 at the Democritus University of Thrace, Greece, I decided to acquire more knowledge and specialise in reproductive science.

I started a project based MSc in reproductive biology at the University of Edinburgh. Joining UK academic life was a great challenge. However, I soon became keen to continue my studies for a PhD, and was very lucky to be awarded a 3-year Principal's PhD Studentship at Edinburgh, to study the role of steroid hormone signalling in human ovarian surface epithelium wound healing.

I spent 3 years with Professors Ian Mason and Steve Hillier investigating how steroid biosynthetic enzymes and steroid receptors are regulated during ovulation-associated inflammation, and how this is relevant to the development of epithelial ovarian cancer. It was really exciting, and an honour for me, that this project was selected for presentation as a Young Endocrinologists Prize Lecture at a meeting as prestigious as Society for Endocrinology BES 2009. I thank the Society for Endocrinology for this award, and for its financial support, which has allowed me to attend national and international endocrine meetings, and to present my data there.

After obtaining my PhD in January 2009, I started my first post-doc at Imperial College London, in Professor Catherine Williamson's research group. We are investigating the development of metabolic deficiencies in the offspring of cholestatic mothers. We hope our findings will improve the well-being of pregnant women and the delivery of healthy offspring. This post-doctoral fellowship will definitely give me the opportunity to develop my skills and qualifications that will progress my academic career.

I fully anticipate that membership of the Society for Endocrinology will provide an important contribution to my career development.

GEORGIA PAPACLEVOULOU



Georgia Papacleovoulou



Tom Barber

► Following MRCP, I entered the specialty of endocrinology in 2002, and was originally based in the northern region. In 2004, I was awarded a clinical training fellowship based at the Oxford Centre for Diabetes, Endocrinology and Metabolism (OCDEM). This led to the award of a DPhil from the University of Oxford.

During my research at OCDEM, I was extremely fortunate to have Professors Wass and McCarthy as my supervisors. They have been incredibly supportive and I am indebted to them. This, combined with the unique environment that OCDEM has to offer in terms of expertise, facilities and collaborative opportunities, enabled me to develop as a researcher. It also facilitated a fruitful period which resulted in the publication of over 10 papers in peer-reviewed journals and numerous invitations to speak at both national and international meetings.

My research studies at OCDEM were based on polycystic ovary syndrome (PCOS). More specifically, I performed genetic studies and also focused on metabolic aspects of this highly prevalent and hugely important endocrine condition. I was fortunate to have Professor Steve Franks (Imperial College London) as a close collaborator. He provided invaluable support and inspiration, and without him much of my work would not have been possible.

One of the genetic studies resulted in the identification of genome-sequence variants within the *FTO* gene as the first to convincingly be shown to be associated with susceptibility to PCOS. This study was the subject of some media interest and included an article posted on the BBC website in March 2009. The award of the Young Endocrinologist Clinical Prize Lecture has been a highlight of my career. I feel privileged to have received it and it was an honour to have been able to deliver my presentation to this esteemed Society at the 2009 annual Society BES meeting.

One of the most important roles fulfilled by any Society should be to recruit, enthuse, support and encourage its younger members. I believe that the Society for Endocrinology has fulfilled this important role to great effect and continues to do so. The future of our specialty is dependent upon the support provided to young endocrinologists, and the ability to attract pre-specialised doctors and medical students into endocrinology. The Society for Endocrinology achieves this in numerous ways and long may this continue. I would like to thank them personally for their support during the early stages of my career.

TOM BARBER

This year's Young Endocrinologists Prize Lecturers begin this special issue on education by telling us a little about themselves, and what the prizes mean to them.



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Image: Pituitary gland, TEM © STEVE GSCHMEISSNER/SCIENCE PHOTO LIBRARY

Undergraduate Essay Prize 2009

► This year saw 55 entrants for the competition, and the quality of essays submitted was highly impressive. Each was marked and ranked by a distinguished panel, and the process was overseen by the Society's education representative to Council.

As in previous years, most entrants were medical students (65%), with 25% of the essays from science students and 10% from veterinary students. The geographical range of universities represented was very encouraging, extending from Brighton and Sussex Medical School to Peninsula Medical School, Durham, and Glasgow. For the first time we had an entry from a post-1992 group university, which was most welcome. Clearly this competition is 'working' as a way of promoting endocrinology in universities.

Ultimately there could only be one winner, and the top prize of £1000 was awarded to Adam Hexter, currently in the second year of a 5-year MB BS course at Barts and The London School of Medicine and Dentistry. Part of his essay appears below; you can read the full version with references online at www.endocrinology.org/grants/prize_undergraduateessay.html.

The Society also awarded £250 to four runners-up: Helen Butler (London), for 'The obesity crises: cannabinoid antagonists to the rescue!'; Zi Wei Liu (Cambridge), for 'Love: written in the stars, or in our hormones?'; John Ser Pheng Loh (London), for 'Ghrelin - the elixir pill to all?'; and Ann Powles (London), for 'HRT: high rate of total confusion'.

STRESS AND HEALTH: WHAT WILL BE THE TRUE 'COST' OF THE CREDIT CRUNCH?

An excerpt from the winning prize essay for 2009.

What is allosteric load?

The paradox of stress-induced harm on the body was first considered by Hans Selye, with his concept of the 'general adaptive syndrome'. Selye's work left a platform for subsequent studies that have yielded the more comprehensive concepts of allostasis and allosteric load.

Allostasis is the process of achieving 'stability through change' and is fundamental for maintaining homeostasis during adversity. This occurs through allosteric systems, such as the HPA axis and autonomic nervous system, which have the capacity to 'adapt' to meet the demands of internal or external stressors. Crucially, allostasis is only advantageous to humans in moderation - allosteric load refers to the pathophysiological consequences that accompany excessive allostasis and is dubbed 'the price of adaptation'. The commonest mechanism behind allosteric load is simply overwhelming and unrelenting stress, with subsequent dysregulation of stress hormones.

Is there such a thing as 'good stress'? Indeed there is, exemplified by the feelings of satisfaction experienced upon finishing a marathon - this is called eustress. Stress associated with negative emotions is termed distress. Interestingly eustress and distress use the same physiological systems and thus are equally taxing. However, the 'perception of stress' does influence physiology. If a person feels that they have little control over the stressors they face, referred to as an external locus of control, then there is greater activation of the HPA axis than in those people who are more in charge of their lives.

But how exactly does stress 'get under our skin'?

This is an excellent question. However, the mechanism by which stress causes disease is not fully understood: is it the direct neuroendocrine effects or the associated adverse behaviours, such as alcoholism? The reality probably involves both.

What does your friend look like after recent overexertion at work? Let me guess, they appear 'drained' as if they have aged somewhat. Well such observations prompted research that asked, 'does stress accelerate the rate at which people age?' Cortisol is implicated in increasing oxidative stress by decreasing antioxidant enzymes and it has been observed that women who suffer from greater stress experience greater oxidative DNA damage, particularly to the telomeres, which are found to be shorter than expected. Telomeres are the protective regions of DNA that cap chromosomes, and the fact they shorten with every cell division means telomere 'shortness' can be used to ascertain cell senescence. Intriguingly, the fact chronic stress is associated with shortening of telomeres suggests stress accelerates cellular ageing via cortisol-induced telomere damage. This could account for the phenomenon of earlier onset of age-related diseases in chronically stressed individuals.

But if you are reading this basking in the knowledge that you lead a somewhat laid back, luxurious lifestyle then be warned: events that happen before birth can also influence health in later life. Low birthweight babies have been shown to be more prone to acquiring a dysregulated HPA axis, higher cortisol levels in later life and greater cardiovascular mortality. Moreover, chronic maternal stress during pregnancy is associated with impaired physical and cognitive development.

Even so, do not be disheartened. Stress is a fact of British life but can only significantly damage health if we allow it to. By taking charge and changing the way we live and perceive our lives right now, we can all minimise the harmful effects of stress. So when you next hear the words 'credit' and 'crunch', bear in mind the following statement made by the author Adabella Radici, 'If your teeth are clenched and your fists are clenched, your lifespan is probably clenched.'

ADAM HEXTER

Education and career development

► **Earlier this year, a new Education and Career Development Sub-committee was set up, as a sub-group of the Science Committee.**

This Sub-committee is looking at several new projects. Probably the most important of these relates to the career development of early career researchers. While there is a limited amount that a scientific society can achieve in terms of improving the job market for scientists, there are some things that we can do. The Sub-committee is prompting the Society to take a much more active lead in career development. Enhanced career information on the website provides endocrinologists with information about the range of careers that is available to you: from academia to clinical biochemistry, as well as writing, industry, publishing etc. We are also looking at ways in which we can help junior members with, for example, fellowship applications. Through the Society, we aim to encourage the new Society of Biology to lobby the government for an improved career structure for scientists.

We hope in the future to be able to produce educational materials to help colleagues in universities to deliver an endocrinology curriculum. If anybody out there has a good special study module that they use in their medical school we'd really like to hear about it.

The Sub-committee has taken over the work of a couple of working parties, such as the Education Working

Group, and has put this activity on a more formal basis. We oversee established activities including the Undergraduate Prize Essay Competition (now in its third year), and this year have set up the Postgraduate Prize Essay Competition. The Sub-committee is also involved in planning the Young Endocrinologists Retreat in October, as well as recruiting young endocrinologists to attend, and helping with the actual delivery of the event.

JOY HINSON
CHAIR, EDUCATION AND CAREER DEVELOPMENT SUB-COMMITTEE

Life Sciences Careers Conference 2009

The Society of Biology Life Sciences Careers Conference takes place 13:00–18:00 on Wednesday 25 November 2009 at King's College London.

The conference, sponsored by the Society for Endocrinology, will provide information about the wide range of science-related careers available to life science graduates. Presentations will cover careers from academic research to environmental science and science communication, a CV workshop (providing tips on how to ensure you secure an interview for your perfect job), an exhibition, and the opportunity to mingle with experts and ask informal questions over lunch and afternoon refreshments.

Further information can be found at www.endocrinology.org/careers or by contacting the Society at careers@endocrinology.org

HOW HORMONES SHAPE YOUR LIFE

► **The Society teamed up with Science Oxford in May to host a very successful public lecture on sex hormones. Professor Stephen Franks of Imperial College London delivered an informative and engaging talk, 'How hormones shape your life: reproduction and long-term health', in which he explained the science behind the female reproductive system.**

Picturesque Oxford was the perfect setting for this event, which began with a wine reception in the colourful exhibition space of Science Oxford. The interactive exhibits and eye-catching displays provided a relaxed atmosphere, allowing the audience to mingle before the lecture. Armed with drinks and nibbles, and eager to hear Professor Franks' talk, they then made their way to the lecture theatre.

After a brief introduction from the Science Oxford chair, Professor Franks gave an overview of the female reproductive system, the hormones involved and their role in the menstrual cycle to a captivated Oxford audience. He



described how women have a limited number of eggs that rapidly decline in their 40s, and gave examples of conditions that arise when the menstrual cycle fails.

The enthusiastic audience, many of whom were regulars at Science Oxford, asked questions throughout the talk and were keen to know whether researchers were looking into delaying the menopause to allow women to have children into their 50s. Professor Franks deftly fielded the questions. He explained that, over the last century, the age of onset of the menopause has remained steady at around 50 years, but our life expectancy has gradually increased. Equipped with many more questions, the audience put Professor Franks through his paces, and the debate continued over drinks in the more informal setting of the exhibition space.

This was a highly successful evening and we were encouraged by the level of knowledge and enthusiasm from the audience. If you would like to watch the event, it was recorded by Science Oxford, and the webcast is available to view at www.scienceoxfordlive.com/watch-us.

We are extremely grateful to Science Oxford for providing such a fantastic venue for the event and to Professor Franks for giving an excellent talk. We were delighted to collaborate with Science Oxford, and we look forward to working with them again on future projects.

If you would like to take part in one of the Society's public events, please send your details to public@endocrinology.org.

REBECCA RAMSDEN

'Ladies and gentlemen and seagulls - right in the middle of my life I find myself right in the middle of a beach, an utterly deserted beach...'



► So starts *The Tide Tables*, a new play examining the conscious experiences of mid-life for women and the biomedical science that underlies these experiences.

This Wellcome Trust funded arts project is the brainchild of Christine Watkins, a writer and performer based in Hereford, with music composed by Sianed Jones and Mary Keith. Through her theatre company Honeysuckle Direction (www.honeysuckledirection.org), Watkins aims to bring together the interconnected realms of science and art to create vibrant and thought-provoking work.

The Tide Tables sees Elin (played by Watkins) holidaying by a beach and finding herself alone. This gives her the opportunity to contemplate her life so far and the changes she feels are happening to her body, over which she has no control. Through spoken word, song and narrative, Elin explores her feelings and experiences and looks ahead to the direction that her life is taking. The play was premiered at the Courtyard Centre for the Arts in Hereford, and the Society was lucky enough to receive an invitation to go along and find out what it was about.

The play is in essence a masterclass in endocrinology by stealth, using a number of different formats to introduce the audience to some quite complicated biomedical theories while still maintaining clarity and entertainment. It attracted a surprisingly wide cross-section of the public, about 160 people in total, and the medium proved to be a successful and innovative method to communicate science, particularly to people who may not be traditionally interested in this area.

Music was provided by the haunting tones of Sianed Jones as the mysterious lifeguard figure, whose thoughtful and reflective compositions echoed the confusion and uncertainty experienced by Elin.

Humour and light-heartedness were most definitely supplied by the ever-cheerful Beach Radio, a quartet of

singers led by Mary Keith, broadcasting the airwaves from 49-56 FM, and coming to Elin in the middle of her life to answer all her queries. Their songs covered a dazzling array of topics from phytoestrogens and hormone replacement therapy to osteoporosis, wrinkles and even hormone cascades and gonadotrophin-releasing hormone (I kid you not!) - a range of topics every endocrinologist would be proud of!

The Tide Tables also aimed to explore the biomedical changes behind the menopause, as well as the conscious experience itself. Scientific input for the play was provided by Professor Saffron Whitehead from St George's University of London. As well as giving a guiding overview to the science contained in the play, she participated in the performance itself by providing a voice-over during the interval, examining the history of hormone replacement therapy.

The history of the therapy ranged from the first curious experiments, performed in 1889 by Charles-Edward Brown-Séquard, in which he injected himself with a liquid extracted from the testicles of guinea pigs and dogs (he claimed he gained great benefit from this!), to modern day techniques. Professor Whitehead also participated in a workshop the next day, along with Christine Watkins, to discuss the art and science of mid-life and how current scientific research and knowledge were combined to form the basis of the plot.

As a first performance, *The Tide Tables* was successful in achieving its aim of engaging the audience in a reflection of the biology and biochemistry of the middle phase of our lives, and the different ways in which we respond. Honeysuckle Direction is now planning further performances of this production. For more information, including a video clip of the performance, visit www.honeysuckledirection.org/tidetables.

JENNIE EVANS



Practical Biology

► The Practical Biology website (www.practicalbiology.org) is a collaboration between the Nuffield Foundation Curriculum Programme and the Biosciences Federation (BSF), with the Society for Endocrinology amongst the principal sponsors.

It provides teachers of biology at all levels - from key stage 3 to A-level - with a growing collection of quality-assured practical protocols that demonstrate a wide range of biological concepts. Some protocols have tightly specified learning outcomes, while others could be used as starting points for open-ended investigations.

Detailed technical notes provide tips for teachers and technicians on handling the materials involved, as well as highlighting hazards and providing preliminary information for

risk assessments. All the protocols have been safety checked by CLEAPSS. Student sheets focus attention on key observations and offer opportunities for students to evaluate the protocols.

The project has already provided practical biology professional development for teachers and technicians in partnership with the Science Learning Centres. This raises the profile of the site with practising and student teachers, and provides a chance to gain direct feedback on the materials.

Several BSF members have provided materials related to their areas of interest, and there is scope to develop more resources in this way. One way to prepare A-level students for undergraduate work is to provide information about research protocols with real research data that they can analyse.

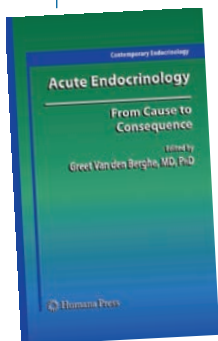
With the ongoing support of organisations such as the Society for Endocrinology, Practical Biology will be able to provide innovative resources that prepare school



students for further studies in biology and help them understand the vital contribution that biological science makes to our understanding of the world. Any endocrinologists out there with ideas to offer should contact jennie.evans@endocrinology.org.

CAROL LEVICK, PRACTICAL BIOLOGY

One example project: making a model lung to investigate asthma



Acute Endocrinology: from Cause to Consequence

G Van den Berghe (Ed), Humana Press, 2008, 316pp, £72, ISBN 978-1-60327-176-9

► Critical illnesses such as severe sepsis, head injury and burns have long been known to have dramatic effects on almost all hormonal systems. More recently, basic and clinical research has explored whether these changes protect the body or, alternatively, worsen the outcome of severe illness.

High profile, and controversial, trials examining endocrine manipulations of cortisol and glucose levels in critical illness have required improved communication between endocrinologists and intensive care specialists. Against this background, this book aims to summarise current knowledge in this emerging field.

The first section deals with potentially life-threatening endocrine problems that might present to the intensivist, including thyroid disorders, hypoadrenalism, pheochromocytoma and diabetic emergencies. The second looks at the endocrine response to critical illness. Chapters include the responses of the somatotroph, adrenal and thyroid axes to severe illness, as well as sodium disorders and the use of intensive insulin regimens.

This works well and is a tribute to the experience of the editor, who, more than anyone else, has developed research into the endocrine response to critical illness, which is reflected in her authorship of several chapters. The other authors are also of the highest international standing.

It is likely that endocrinologists and intensivists would each get something different from the book. Endocrinologists would probably not gain much from the

chapters relating to common endocrine problems, or to the use of catecholamines. Intensivists are likely to find almost all the book useful, perhaps excepting some of the material dealing with out-patient management.

Some aspects were frustrating. Values given for cortisol, glucose and electrolytes are not the metric values used in Europe, and no conversion factors are given. This suggests the book is aimed at an American audience. Likewise, routine and frequent liver function tests and neutrophil counts in patients taking thionamides are stated as essential, but are not recommended in the UK.

Inevitably, publications in fast-moving areas have aspects that rapidly date. The chapters on intensive insulin treatment will be affected by a recent high profile trial that has probably altered the conclusions. In addition, the chapter on glucocorticoid replacement contains an unpublished meta-analysis strongly supporting the routine use of hydrocortisone treatment in sepsis. This advice is contrary to most current international recommendations and I think this conclusion should have been tempered accordingly.

Overall, the book will be of interest to many clinicians at the interface of endocrinology and critical care. It will be most important for rapid reference when a sick patient with an endocrine problem is admitted to the critical care unit. Although some chapters will become outdated rapidly, they all provide a useful foundation and, for the rarer conditions, are likely to provide important emergency advice for many years to come.

MARK COOPER

Audience behaviour bears closer evaluation

*Hotspur
despairs at
audience
etiquette*

► I grew up and went to school in London. The secondary school was a long way from where I lived, and I didn't know a single other boy. In the first few days at the new school, I became aware of a longstanding tradition whereby the second year boys chased the new boys and imprisoned them in the 'bear-pit' for the duration of the lunch break.

Not surprisingly, I did not like the sound of this tradition, so when Gibbins, a second year, approached me with capture in mind, it resulted in a fight. I managed to get the better of Gibbins in the battle, not difficult as he was no bigger than me. Gibbins then sent for Mason, another second year, to deal with me. Mason, however, was similar in height to Gibbins and again I got the better of him and avoided capture. At this point Gibbins and Mason sent for Tizer, and immediately I ran and hid under a coat in the cloakrooms for the duration of the lunch break!

That was a defining moment in my overall development. In some ways it was encouraging; it confirmed that I had good eyesight and a certain basic intelligence with regard to self-preservation. As Tizer was built like the side of a house and the ground shook as he walked down the middle of any corridor in the school, my expectation was an unpleasant death of the traumatic variety, if he found me.

On the other hand it was also a sad occasion, as it illustrated for the first time self awareness of my own limitations and an acceptance of my cowardice in the presence of fear. I was no longer pluripotential, the sky was no longer the limit, certain achievements, such as standing up bravely in opposition to Tizer, were beyond my capacity.

Knowing one's limitations is an asset as a speaker too, whether it be in an endocrine or any other type of meeting. The duration of the talk is usually pre-determined by the organising committee, irrespective of which, I find it nearly impossible to listen to any speaker on any topic in endocrinology for longer than 45 minutes. Occasionally, however, one is forced to break the rules.

On a trip to Taiwan I was asked to give two talks of 1 hour each, consecutively, to the local paediatric club. The meeting was held on a Saturday afternoon, with only a 7-minute break between the talks. I indicated to the chairman, a local geneticist, that I felt sorry for the audience facing a 2-hour onslaught in the middle of their weekend. He replied with disdain for my objections, telling me that when he lectured it was for never less than 4 hours at a time!

From bitter personal experience I realise how hard it is for an audience to remain awake, alert and stimulated during a lecture. About a year ago, I was sent an audio CD of a talk that I had given 6 months earlier. I was quite excited, I had never heard myself lecture. I played the CD and within 10 minutes

I was sound asleep, sitting bolt upright. To put this in context, I have never previously or since fallen asleep in a chair at my computer.

Nonetheless, whilst I have compassion for the audience, the behaviour of certain members is galling. So much so that I wonder if we have not reached the stage when, instead of asking the audience to evaluate the speaker, we should turn things around and ask the speakers to evaluate their audience!

The list of complaints would include the reading of a newspaper during a talk, the use of a mobile phone, and the checking of email on their laptops. And what about the farce which affects the question time of any speaker giving the last talk before a coffee break or lunch? At least two-thirds of the audience steam out as soon as the talk is over – meaning that no questions can be asked because they would be drowned out by the sound of stamping feet, rushing their owners towards a drink which is usually nothing more than lukewarm and indeterminate in identity between tea and coffee.

Perhaps evaluation sheets should only be used for new studies and/or fun. What if we decided to study aspects of social behaviour of the delegates at the meeting and gather objective data? I suggest we weigh all delegates at registration and then again when they leave the meeting several days later. This would allow us to determine gender variation in weight gain over the meeting period and, if international, we could calculate national greed scores, which could be expressed as absolute or percentage gain in weight. The study could be extended to alcohol intake if liver function tests were performed at the same time points.

Recently I enjoyed an evaluation-free meeting in Berne, Switzerland. On the spare afternoon I had a look at the sights. Berne is famous for its bear-pit. I approached with caution, but it was not bears that I was on the lookout for.

'HOTSPUR'



Hot Topics

Journal of Endocrinology

Journal of
Endocrinology

Understanding ghrelin's effect on hunger

Kola and Korbonits review the actions of ghrelin in suppressing appetite. Recent studies led the authors to construct a hypothesis explaining the intracellular pathway for ghrelin. The authors propose that many areas need more investigation, including the pathways and mechanisms of central ghrelin and its role in peripheral metabolism. Given the increase in the number of patients with obesity, further studies into ghrelin, AMPK and other factors involved in appetite regulation are extremely important.

↪ DOI: [10.1677/JOE-09-0056](https://doi.org/10.1677/JOE-09-0056)

HPA response to oestrogen

This study by Evarherhe and colleagues addresses how oestrogens in the peripubertal period influence pituitary-adrenal activity. The authors show that oestrogens administered during this period attenuate ACTH and corticosterone responses to stress, in contrast to the stimulatory action of oestrogens on the adult HPA axis. This research further suggests that exposure to sex steroids in the neonatal period programmes adult HPA activity, while in puberty a non-sex-steroid-dependent process develops the stimulatory effect of oestrogens on the HPA axis.

↪ DOI: [10.1677/JOE-09-0175](https://doi.org/10.1677/JOE-09-0175)

Maternal nicotine during lactation

This study by Oliveira and coworkers examines the effects of maternal nicotine during lactation in rats, and the effects this may have on the adiposity and thyroid status of the offspring. If the findings translate to humans, this may explain the prevalence of obesity in children exposed to cigarette smoke during the perinatal period. The study found that nicotine imprints a neonatal thyroid dysfunction and programmes for a higher adiposity, hyperleptinaemia and secondary hypothyroidism in adulthood.

↪ DOI: [10.1677/JOE-09-0020](https://doi.org/10.1677/JOE-09-0020)

JOURNAL OF MOLECULAR ENDOCRINOLOGY

JOURNAL OF
MOLECULAR
ENDOCRINOLOGY

Ghrelin and GH interaction

A model by Wagner and coworkers of the interactions of ghrelin with the GH neuroendocrine axis has predicted that ghrelin stimulates the secretion of neuropeptide Y, and that it has different functions at the hypothalamus and the pituitary. These novel features were experimentally verified and contribute to the better understanding of the *in vivo* role of ghrelin.

↪ DOI: [10.1677/JME-09-0023](https://doi.org/10.1677/JME-09-0023)

GATA4 in the heart and gonads

The implications of deficiencies of the transcription factor GATA4 have been studied by Thurisch and colleagues. Transgenic mice showed that decreased Gata4 expression was associated with decreased expression of known cardiac genes, and of different downstream target genes in the ovary and testis, affecting the function and integrity of the gonads. These findings have implications for patients with inherited GATA4 deficiency.

↪ DOI: [10.1677/JME-09-0030](https://doi.org/10.1677/JME-09-0030)

Endocrine-Related Cancer

Endocrine-Related
Cancer

TSH in thyroid cancer

Two recent studies showed that high TSH levels are associated with increased risk of developing papillary thyroid cancer in patients with thyroid nodules. This paper by Fiore and colleagues confirms this in a very large cohort of subjects (>10 000), and extends the observation by showing that patients with low TSH levels have diminished risk of thyroid cancer. These findings suggest that TSH may play a fundamental role in thyroid cancer initiation or progression.

↪ DOI: [10.1677/ERC-09-0036](https://doi.org/10.1677/ERC-09-0036)

MicroRNA in adrenocortical cancer

Adrenocortical cancer pathogenesis is incompletely understood. Tombol and colleagues applied a combined microRNA (miR) and mRNA expression profile to distinguish benign adenomas from carcinomas (ACC). They found that expression of miR-184 and miR-503 was significantly higher, whereas that of miR-511 and miR-214 was significantly lower in ACCs than in other groups. Two of these, miR-511 and miR503, are sufficient to provide diagnostic discrimination. The expression profiles also hint at a possible dysfunction of the G2/M cell cycle checkpoint in ACC pathogenesis.

↪ DOI: [10.1677/ERC-09-0096](https://doi.org/10.1677/ERC-09-0096)

Clinical Endocrinology

Clinical
Endocrinology

Vitamin D in severe obesity

Stein and colleagues assessed the influences of race, sun exposure and dietary intake on vitamin D status, and evaluated two vitamin D repletion regimens prior to surgery in extremely obese patients. The study shows that, in severely obese individuals, those who are African American, have a higher BMI and limited sunlight exposure are at greatest risk for vitamin D insufficiency, factors which can identify at-risk patients for vitamin D repletion prior to bariatric surgery.

↪ DOI: [10.1111/j.1365-2265.2008.03470.x](https://doi.org/10.1111/j.1365-2265.2008.03470.x)

TSH and vascular inflammation

Desideri and coworkers evaluated the effect of recombinant human TSH (rhTSH) on biomarkers of vascular endothelial cell and platelet activation in patients monitored for thyroid carcinoma remnant. This study provides the first evidence that TSH is associated with proatherogenic activation of vascular endothelial cells and platelets, and enhanced lipid peroxidation. It remains to be demonstrated that this detrimental proinflammatory and proatherosclerotic phenotype might also occur due to the mild but persistent TSH elevation observable in patients with chronic hypothyroidism.

↪ DOI: [10.1111/j.1365-2265.2008.03485.x](https://doi.org/10.1111/j.1365-2265.2008.03485.x)

TSH diagnoses hypopituitarism

Jostel and colleagues propose a TSH index method, which provides an accurate estimate of the severity of pituitary dysfunction in hypopituitary patients based on simple thyroid function tests. The method predicts the probability of pituitary stimulation test failure and extends the diagnosis of TSH deficiency into areas of the normal thyroid function test reference range. A subnormal TSH index could provide an indication of central hypothyroidism in patients without primary thyroid disease.

↪ DOI: [10.1111/j.1365-2265.2009.03534.x](https://doi.org/10.1111/j.1365-2265.2009.03534.x)



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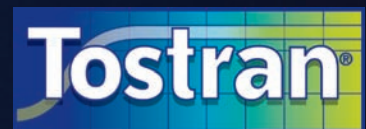
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must be discontinued immediately if such complications occur. Testosterone may cause a rise in blood pressure and Tostran should be used with caution in men with hypertension. Tostran should be used with caution in patients with ischemic heart disease, epilepsy, migraine and sleep apnoea as these conditions may be aggravated. Care should be taken in patients with skeletal metastases due to risk of hypercalcaemia/hypercalcuria. In diabetic patients, the metabolic effects of androgens may decrease blood glucose and therefore insulin requirements. Patients who wash in the morning should apply Tostran after washing, bathing or showering. Avoid the potential for transfer of testosterone from the patient to another person by careful hand washing and the wearing of loose clothing after the gel has been applied and has thoroughly dried. Bathe or shower before any close contact with another person. Particular care must be taken to prevent transfer of testosterone to pregnant women or children via skin contact. **Interactions** When androgens are given simultaneously with anticoagulants, the anticoagulant effect can increase and patients receiving anticoagulants require close monitoring of their INR. Concurrent administration of testosterone with ACTH or corticosteroids may increase the likelihood of oedema and caution should be exercised. **Undesirable effects** Very common (>1/10): application site reactions (including paresthesia, xerosis, pruritis, rash or erythema); common (>1/100, <1/10): peripheral oedema, hypertension, polycythemia, increased prostate specific antigen, hirsutism, gynaecomastia. Certain excipients may cause irritation and dry skin. **Pack Size and Price** Packs containing one or three 60 g metered-dose canisters per pack. Price £26.67 per

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