AuPS News

October, 2009

Kyoto IUPS Report

A total of 3800 registrants attended the 36th International Congress of Physiological Societies in Kyoto, which ran over six full days from Monday 27th July till Saturday 1st August. The Congress had never previously been held in Kyoto and it has been 40 years since the last time it was held in Japan (Tokyo). The Congress was held in the Kyoto International Conference Centre, best known for its hosting of the United Nations-sponsored Kyoto Protocol Convention in 1997. The Conference Centre is located in beautiful mountainous surroundings at one end of the municipal subway system and hence is easy to access from the city. Indeed, most registrants commuted daily from hotels in the central business area. Kyoto is a beautiful, lively city with many historical temples, traditional gardens and other sites that most of us simply had insufficient time to do enjoy properly.

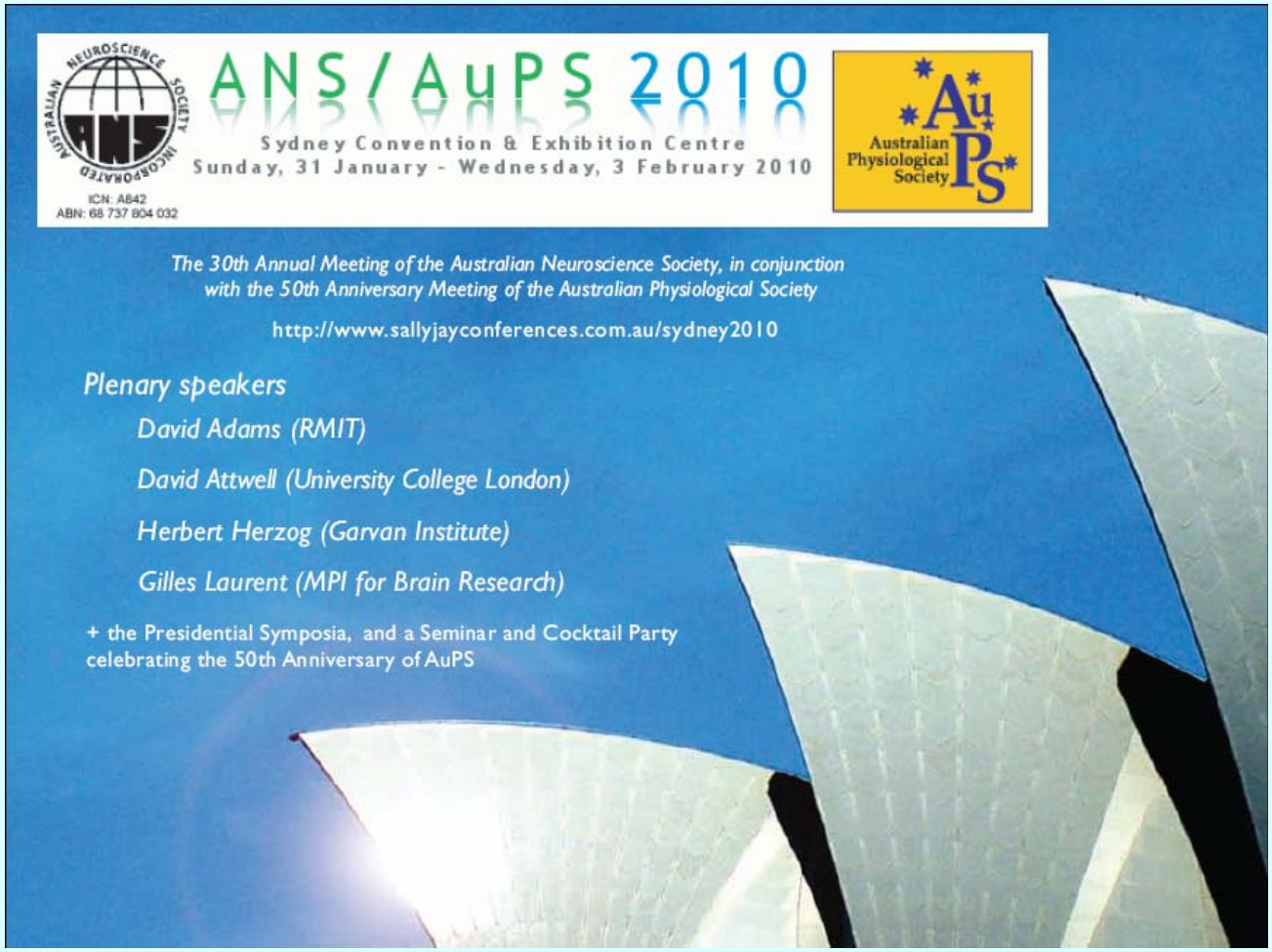
Australian scientists featured prominently on the scientific program. Around 70 of the ~2000 communications included Australian authors. A large percentage of these were AuPS members. Stefan Broeer, the AuPS treasurer, presented a plenary lecture on inherited disorders of amino acid transport. AuPS members who gave symposia presentations included Caroline McMillan, David Cook, Mark Hargreaves, James Pearson, Murray Esler, David Williams and David Allen. AuPS contributed to the travel costs of three postgraduate student members presenting at this Congress.

The General Assembly of the International Union of Physiological Societies (IUPS), which is held every 4 years, was run on the Sunday preceding the Congress. It was attended by several AuPS members, including David Adams, David Cook, Joe Lynch, Caroline McMillan and Ann Sefton. One of the main items of business at the Assembly was to vote for the venue of the 2017 meeting. The candidate venues were Beijing (China), Toronto (Canada) and Rio de Janeiro (Brazil). Brazil narrowly won over China, and as a result the 2017 IUPS Meeting will be held in Rio de Janeiro. Birmingham (UK) will host the next IUPS Meeting in 2013 and a presentation was given on the progress of planning for this meeting.

I have received the Minutes of the Federation of Asian and Oceanian Physiological societies (FAOPS) Council Meeting that was also held in Kyoto during the Congress. The main news is that future FAOPS Congress dates have been changed so that they run two years out of phase with the 4-yearly IUPS Congress. The 7th FAOPS Congress will be held in Taipei from September 11–14, 2011, and the 8th FAOPS Congress will be held in Thailand in 2015.

Meetings in 2010

50th Anniversary Meeting



EARLY REGISTRATION & ABSTRACT DEADLINE: **Monday, 26 OCTOBER 2009**

Program details including plenary speakers and symposia details can be viewed at:
http://www.sallyjayconferences.com.au/sydney2010/program.html

Online registration and abstract submission can be made easily at:
http://www.sallyjayconferences.com.au/sydney2010/registration.html
http://www.sallyjayconferences.com.au/sydney2010/abstracts.html

Satellite Meetings

Six exciting satellite meetings are being held around the main meeting as follows:

Vision: from Photoreceptors to Behaviour
Neuroscience of Fear and Anxiety
7th Australasian Auditory Neuroscience Workshop
Dementia, Ageing and Neurodegenerative DISeases Group (DANDIS)
Sensorimotor Control of Movement
Automated Neurite Tracing and Image Analysis for Neurobiology

Details can be found at: http://www.sallyjayconferences.com.au/sydney2010/satellite.html

Reaching for Higher-Hanging Fruit: the Promise of Synchrotron Technology and Physiology.

A new era has commenced in synchrotron science that opens a window of opportunity to probe deeper into various aspects of physiology. Historically synchrotrons were the instruments of hardcore physics and engineering; used to study the origins of the universe, subatomic entities or material properties. It is also commonly held that synchrotron science is too expensive, complex and therefore inaccessible. However, a broadening spectrum of applications, simpler or even remote access, and the emergence of new synchrotron disciplines has made modern synchrotrons a powerful tool for biological applications. This short AuPS Q&A piece gives a view from the tip of the iceberg on some of the synchrotron techniques and how such techniques can address the higher-hanging fruit in physiology research.

What are synchrotrons and why would we use them?

In the simplest terms a synchrotron is a very bright light-bulb. However, the light produced from a synchrotron is very special and differs in simple, but fundamental ways from the light we might use in convention laboratory instruments.

The basic principle is that light can be produced from charged particles as they lose energy as photons of electromagnetic waves. As illustrated in Figure 1a, conventional lamps and lasers produce photons of light in a disordered manner; the waves are out of phase with respect to each other, their frequency is often within a narrow range and the flow rate of the photons (flux) is often poor and tends to decay significantly in the vacuum ultraviolet region of the light spectrum (shorter wavelengths <260nm). The effect is also a significant level of noise inherent to all light-based instruments.

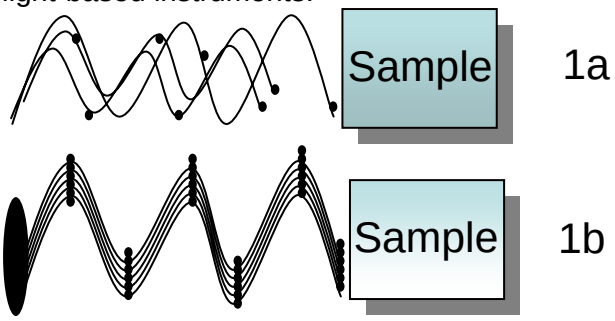


Figure 1: (1a) Standard instruments produce light of a low flux and poor coherence with different phases irradiating the sample. **(1b)** The synchrotron light photons are in phase and have a very high flux.

The synchrotron overcomes these limitations as charged particles are accelerated to almost the speed of light and placed within a high vacuum storage ring where the electric and magnetic field are varied (synchronously), causing the charged particles to "bunch up" and the electromagnetic waves to travel in-phase (figure 1 and 2). In this case, when these charged particles emit photons of light they are collected in the synchrotron instrumentation and they are delivered to the sample in-phase.
They can also cover a much broader range of the electromagnetic spectrum (which can be selectively filtered before the sample) and have a very high flux compared to light from conventional sources. Finally the photons decay far less in the vacuum ultraviolet region (indeed for some applications the synchrotron fluxes may be ~10^{15} as far as 150nm before decay *cf* xenon lamps which are ~10^{9} at this wavelength). Comparing the data from a synchrotron and conventional laboratory instrument is similar to comparing a slide with and without immersion oil on the objective lens. The data is still there, but the resolution and hence level of detail and quality from a synchrotron is superior in every way.

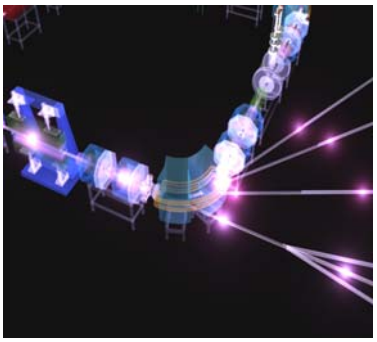


Figure 2: Bunched charged particles are shown to shed light within a high vacuum storage ring. The light leaves the particles much like the light from car "high beam" continuing in a straight line as a car goes around a corner. This image was created by Coldvision Studio (www.coldvision.se), who have created a fantastic series of movie files on how a synchrotron works available from ISA-ASTRID: http://www.isa.au.dk/animations/animations.html

What synchrotron techniques are relevant to Physiology?

Can synchrotron methods help the average physiologist and address the breadth of as yet unanswered questions in our discipline? The answer is a big "yes". Literally any technique or instrumentation that involves the use of the electromagnetic spectrum can be modified for use with a synchrotron light source (beam).

Indeed we shouldn't limit ourselves to only what is currently available as many synchrotrons have experimental/developmental beamlines that scientists can use to translate laboratory techniques to synchrotron sources, or create entirely new techniques and applications. Most physiologists are familiar with optical honeycomb tables and constructing custom rigs. These are also the bread-and-butter basics to building synchrotron instruments (an example is shown in Figure 3). For these reasons it is clear that any physiologist can translate something they are doing currently in their labs to a synchrotron beamline.

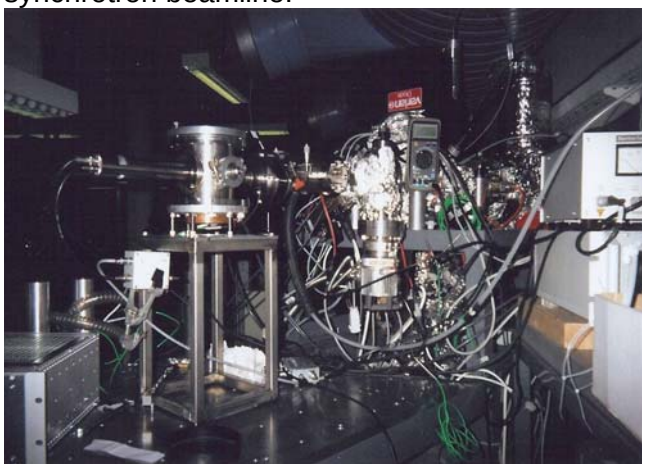


Figure 3: This Circular Dichroism beamline was assembled by the author (LP) in a single day and is placed onto a honeycomb board directly above a bending magnet on the storage ring. The basics of a CD instrument are illustrated (PEM = photoelastic modulator). The aluminium foil helps to shield stray light from entering the instrument.

If we think about three main avenues of investigation that are at the forefront of much of the new physiology; structure, protein-protein interactions and imaging. These are all fruitful areas for synchrotron applications. But the question is - why should these be done in a synchrotron? What is the resolution of the system and are there any obvious limitations of the technique?

(1) Biomolecular structure and protein-protein interactions: what's out there and why is it better at the synchrotron?

The correlation of structure and function is one of the most powerful approaches in molecular physiology – hence the need to understand not only protein structure but also protein-protein interactions. Structural biologists – and especially crystallographers – have, and always will be – heavy users of synchrotron light sources as the intensity of the beams allow very rapid collection of X-ray data of a very high resolution. Some of the allied synchrotron techniques that provide structural data including; small-angle X-ray scattering (SAXS), vacuum ultraviolet (VUV) and circular dichroism (CD) spectroscopy, as well as infrared (IR) and terahertz (TZ) microspectroscopy. We shall further discuss SAXS and CD but a good cursory discussion on microspectroscopy for biological applications is here: Miller *et al*., (2003) Synchrotron-based Biological Microspectroscopy: From the Mid-Infrared through the Far-Infrared Regimes. *J Biol Phys* **29**, 2-3.

SAXS is used to primarily extract information about the shape and size of macromolecules with a resolution down to 5 – 25nm. The field is moving in directions such that good quality data can be fitted to further develop existing models built from X-ray and NMR structures (fold recognition) or even for *de novo* prediction. In cases where several three-dimensional structures of the molecule in question fit the data, the models can be aligned and averaged to derive a consensus model.

SAXS can, however, be limited by the protein purity and concentration/volume based on the size and instrument setup. High concentrations are better but protein-protein effects and aggregation can be limiting. A rough rule of thumb is: proteins of ~10 – 15 kDa require a concentration of 2 mg/mL for reasonable data. Proportionally increasing or decreasing the concentration based on the molecular weight from this value can provide a suitable screen. Hence for a 20 – 30 kDa protein a concentration above 1mg/mL is reasonable. DNA and RNA scatter X-rays more strongly than proteins, so the required concentration can be reduced about 5-fold. Depending on the setup, sample volumes can be reasonably large (~0.5mL/experiment).

Synchrotron Radiation Circular Dichroism (SRCD), like conventional circular dichroism, determines the absolute secondary structure configuration of chiral molecules. SRCD gains discrimination of up to 7-8 different structural motifs by penetration into the VUV region and improvement in the signal:noise. The traditional direction in the field is towards structure prediction using database reference sets. However, the latest trend is the application to determine protein-protein macromolecular interactions and assay these interactions in unlabelled sample preparations. The big advantage is it addresses the usual bug-bear of demonstrating that proteins are actually physically interacting rather than being in close association or linked by something else. By

using “predicted” spectra or “summed” spectra, and titrating one of the species, protein-protein interactions can be demonstrated and their nature (lock and key or induced fit – structural changes) can be determined. Naturally mutagenesis or domain-swapping would be a powerful extrapolation but has so far been poorly capitalized upon. Furthermore, variation of species concentrations can be used to determine the equilibrium dissociation constant for unlabelled protein-protein interactions.

Once again, there are limitations as many buffer components reduce the range into the VUV region by creating spectral artifacts. Chloride ions and TRIS are particularly problematic. Liposome and membrane preparations also cause similar effects at high concentrations but can powerfully demonstrate the roles of particular lipid species or structural changes within membrane proteins even at longer wavelength ranges. Protein concentrations can be varied with sample cell pathlengths and volumes to optimize experimental conditions depending on protein sample requirements (concentration and volumes) and the range of sample cells available. Samples down to ~2μL (but at 15-20mg/mL) can be measured readily or up to 1mL volumes in micromolar ranges.

(2) Imaging: what’s out there and why is it better at the synchrotron?

Certainly to the physiologist, the ability to elucidate organ/tissue function and correlate studies down as far as the subcellular level is a paramount goal. For example, two-photon microscopy has already represented a quantum leap in our ability to examine organ/tissue function. The synchrotron, like traditional imagery, can produce two-dimensional or tomographic reconstructions in three dimensions and the spatial resolution is suitable for single cell or tissue analyses. The all-important sensitivity is in the micromolar to nanomolar range, with the monochromatic beam enhancing the image quality beyond what is possible with laboratory techniques. The obvious difference for synchrotron imaging over lab-based methods is that traditional methods do not penetrate very far ~100-200 microns for two-photon and can suffer from heating of the sample. synchrotron techniques can allow complete non-invasive tissue penetration with little sample preparation (a similar amount of preparation as for normal microscopy) or damage. Hence the use of appropriate probes and synchrotron-based imaging can be a very powerful complement to other advanced imaging or experimental techniques.

For imaging we can separate the synchrotron field into three arms: (a) imagery via scanning – these can employ almost all techniques of diffraction/diffusion and spectroscopy (such as those described in **1** above, e.g. IR and X-ray fluorescence microscopy).; (b) Imaging by full-field X-ray microscopes – the spatial resolution is not as good as with electron microscopes (>20nm), however they permit freedom from the typical sample preparation that is required for the electon microscope and greater contrast is obtained from weakly absorbing materials such as soft tissue.; (c) imaging utilising radiographic techniques – here the small spot size, monochromatic character and the weak divergence of the synchrotron light lead to an increase in contrast and finer definition.

(a) Scanning imaging is suitable for studying tissues but is also very powerful when studying compositions. Movements in the field are towards studies within individual cells in dynamic processes such as signalling, apoptosis and necrosis and changes in disease states.

(b) The field of biological synchrotron X-ray imaging appears to have been largely driven by entomologists. Because the penetration of conventional instruments is limited and difficulties wth histological agents, small arthropods have been traditionally problematic to study. These constraints have been overcome by synchrotron X-ray tomography where a pixel-resolution of 0.7μm was achieved (Heethoff et al., (2008) Non-invasive 3D-visualization with sub-micron resolution using synchrotron-X-ray-tomography. *J Vis Exp*. May 27;(15). pii: 737. Movies on Jove: http://www.jove.com/index/Details.stp?ID=737). For these reasons many entomologists have embraced synchrotron techniques and been driving the instrumentation in the field. Such applications do have analogies in general physiology, but the broader interest is in an imaging probe that can penetrate – but has sensitivity – to soft tissue and high spatial (micron to nanometer) and temporal resolution, which is a feature of most synchrotrons imaging techniques.

(c) Radiographic imaging from synchrotron sources are extremely powerful and superior to conventional techniques as the small spot size and high intensity of X-rays allows scanning of samples and provide a composite image in much finer detail than from conventional

sources. Ventilation and perfusion techniques have been developed providing a highly sensitive quantitative analysis of contrast agents (xenon/iodine) without noise arising from light artefacts. Parameters extracted from these experiments include blood volume, blood flow, mean transit time and capillary permeability (perfusion); or lung volume, regional lung ventilation, bronchial lumen size, regional airway and lung compliance (ventilation) (Adam *et al*., (2009) Quantitative functional imaging and kinetic studies with high-Z contrast agents using synchrotron radiation computed tomography. *Clin Exp Pharmacol Physiol*. **36**: 95-106).

Recently, synchrotron angiography has been described providing *in vivo* real-time imaging of microcirculation in brain, kidney, lung and heart tissues. The future of this work is to identify non-uniform vasoconstriction in pathophysiological states such as ischaemic-reperfusion injury, diabetes, hypertension and stroke (Shirai et al., (2009) Synchrotron-based angiography for investigation of the regulation of vasomotor function in the microcirculation in vivo. *Clin Exp Pharmacol Physiol*. **36**:107-16).

What is on the horizon for AuPS members interested in learning more?

Recently, Monash University hosted a "New synchrotron and Neutron Users Symposium 2009" with several interesting talks presented which discuss aspects of the above areas including: "Infrared spectroscopy applications to the study of cell function and tissue pathology" (Bayden Wood), "Dynamic imaging of ventilation with phase-contrast approaches" (Andreas Fouras), "Dynamic studies of cardiac function with contrast angiography and SAXS" (James Pearson) and "Soft x-ray microscopy" (Eric Hanssen). People wishing to obtain presentations from this symposium can contact Karen Siu (Karen.Siu@sync.monash.edu.au) for more information.

In 2010 the next event for AuPS members to attend is in February 15th – 18th 2010 BSR/MASR meetings (Biology and Synchrotron Radiation Medical Applications of Synchrotron Radiation BSR2010 – Melbourne). BSR session themes include protein structure and function, biomaterials, spectroscopic techniques and non-crystalline diffraction (www.bsr2010.org). MSR session themes include X-ray imaging, radiology, dosimetry and radiation biology, oncology, and pathology and diagnostics (www.masr2010.org).

For the more daring, later this year (Sept 28th – Oct 2nd) there is the 10th International Conference on Synchrotron Radiation and Instrumentation 2009 being held in Melbourne (SRI2009 - http://www.sri09.org/), touted as "the world's largest and most important forum for synchrotron radiation science and technology communities, SRI is expected to attract 800 international and Australian delegates."

What should AuPS do to help members capitalise on emerging synchrotron techniques?

The Australian synchrotron is developing world-class specialised imaging facilities with some aspects operational now but full completion scheduled for 2012. The types of materials that can be imaged will be everything from cells up to organs and animals/humans. Techniques will reportedly provide phase-contrast X-ray imaging, two and three-dimensional imaging at high resolution (submicron). This will be one of only three facilities capable of live animal work and these facets will draw Physiologists from all over the world.

Right now there are movements to rally support and develop an Infrared Transmission X-ray Microscope (IR-TXM) which is hoped will provide 3D imaging without contrast agents at unprecedented resolution (≤20nm), sufficient for sub-cellular component/compartment resolution and microfine morphology analysis in intact samples. This beamline would uniquely be capable of combining the morphological and elemental information offered by TXM with infrared and fluorescence probes to simultaneously obtain molecular/compositional information. The contact person for those interested in lending their name for support or chasing further information is Dr Marian Cholewa (marian.cholewa@sync.monash.edu.au).

Clearly forming close ties with the Australian synchrotron can be advantageous to AuPS members, but certainly more lengthy and involved communication than this simple Q&A would be better serving. In order to maximise outcomes for both the Australian synchrotron and the AuPS members, we suggest it is worth considering the formation of a synchrotron Special Interest Group that could foster more beneficial communication, involvement and exchange between AuPS members and the Australian synchrotron, and perhaps as a body the AuPS can provide a strong letter of support for such endeavours.

Ultimately, the use of synchrotron techniques will add new dimensions to our experiments, give us a much deeper window into organ/tissue/cellular function and provides the cutting-edge to our data that will lead to publications in the highest impact journals. For now the epoch of the synchrotron has arrived, and though the train hasn't left the station, the carriages are filling fast and we should consider climbing aboard!

Dr Leonard Pattenden (pictured) & Prof. Philip Poronnik

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Profile of a career (so Far)

Recently awarded Honorary Member Geoffery Burnstock, on the move in KAZAN.

Appointments:

1956-1957	National Institute for Medical Research, Mill Hill, London
1957-1959	Department of Pharmacology, Oxford University
1959	Department of Physiology, University of Illinois Rockefeller Travelling Fellowship
1959-1975	University of Melbourne, Australia: Senior Lecturer, Department of Zoology 1959; Reader in Physiological Zoology 1962; Professor of Zoology and Chairman of Department 1964-1975; Associate Dean (Biological Sciences) 1969-1972
1970	Visiting Professor, Department of Pharmacology, University of California, Los Angeles
1975-1997	Head of Department of Anatomy and Developmental Biology, University College London
1975-2004	Professor of Anatomy, Department of Anatomy and Developmental Biology, UCL
1980-1983	Vice-Dean (Faculty of Medical Sciences)
1979-	Convener, Centre for Neuroscience, UCL
1997-2004	Director, Autonomic Neuroscience Institute, Royal Free & University College Medical School.
2004-	President, Autonomic Neuroscience Centre, Royal Free & University College Medical School
2004-	Emeritus Professor, University College London

Prof Burnstock is presently in Kazan (Russia) for lectures and research discussions and then almost immediately on to Ferrara in Italy to receive the Copernicus Gold Medal and says "I am still pretty active at 80 years old".

Congratulations Prof on being elected as an Honorary Member of the Australian Physiological Society and for your continuing contribution to the field of Physiology.

Election of Honorary Members

Members may be nominated for Honorary membership at any time.
Current Nominations; George Stevenson and Fred Mendelsohn

AuPS - Special Interest Group Coordinators

Muscle
- Graham Lamb
- Gordon Lynch

Smooth Muscle and Autonomic NS
- Caryl Hill
- Dirk Van Helden
- James Brock

Physiology Education
- Phil Poronnik
- Jeff Schwartz
- Anne Sefton

Endocrinology, Reproduction and Fetal Development
- Chen Chen
- Karen Gibson

Cardiovascular
- Livia Hool
- David Allen
- Lea Delbridge

Neurophysiology
- Pankaj Sah

Exercise
- Mark Hargreaves
- Mike McKenna

Metabolism and Signalling
- Mark Febbraio

Cell signalling
- David Cook
- Grigori Rychkov

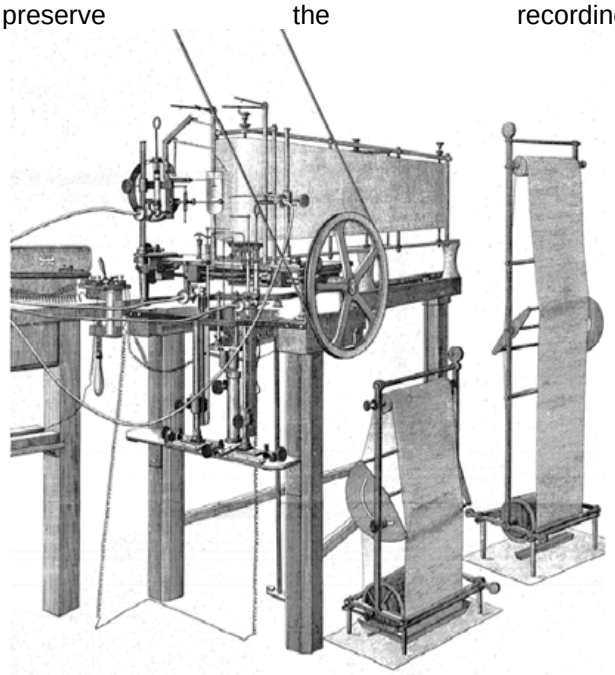
Channels and Transporters
- Stefan Broer
- Jamie Vandenberg

New Special Interest Groups

Nominations for Special Interest Group topics and coordinators are welcome at any time. With the upcoming 50th Anniversary meeting, 31st January – 3rd February, 2010, consider forming a SIG around your topic of interest and plan a symposium.

A Brief History of Data Acquisition Systems

Data acquisition in physiology dates back to the early kymograph invention by Carl Ludwig in 1847. Initially designed to record blood pressure, the early kymograph consisted of a drum attached to a sheet of paper with a stylus that travels to the motion of the rotating drum. For many years, the paper was coated with soot coming from kerosene or petroleum lantern fumes. Smoked paper was wrapped around the drum and the moving stylus created a fine white line on it. At the end of the experiment, the paper was removed from the drum and placed in a tray of varnish to preserve the recording.



Complex Kymograph by R. Rothe, Prague 1893

The development of valves and transistors in the 1960s, created the polygraph paper chart-recorder system which replaced the kymograph. Physiologic signals could be electronically amplified, filtered and recorded on ordinary paper.

Polygraph developed by Grass Instruments Company – circa 1980

ADInstruments History

The history of ADInstruments and its data acquisition product began in 1985 when Tony Macknight, a Professor of Physiology at Otago University, New Zealand, was dissatisfied with the paper chart recorders and bulky smoke drums available for data acquisition. Realizing the potential of the new Macintosh computers that had just been introduced, Tony asked his son Michael to help develop a computer-based data acquisition system to replace the paper-based chart recorders. The resulting analog to digital converter was named MacLab, for use with Macintosh computers that offered Graphical User Interface functionality. The accompanying software, Chart and Scope provided the ability to turn desktop computers into real-time chart recorders, voltmeters, XY plotters and two-channel storage oscilloscopes. With the entrepreneurial and management skills of Boris Schlensky, ADInstruments was established in 1988. The company quickly became a leading supplier of data acquisition equipment for life science research and education. In 1997 the PowerLab data acquisition system was introduced. The new system worked on both Macintosh and Windows computers.
The MacLab/PowerLab system has helped to broaden research possibilities with over a thousand products that cover a diverse range of applications including cardiovascular physiology, neurophysiology, exercise physiology, pharmacology, psychophysiology, telemetry and many more. In education, LabTutor software released in 2005 provides the functionality to transform the methods of recording data and teaching science at the tertiary level with over seventy eight experiments in eight different languages. In 2008, Chart was renamed LabChart to recognise advances made in this core software program. The PowerLab system together with LabChart, Scope and LabTutor software makes it easier and faster to record and analyze experimental data accurately.

ADInstruments & AuPS

ADInstruments has participated and exhibited in Australian Physiological Society (AuPS) conferences since its early years and is currently a sustaining member of AuPS. ADInstruments CEO Graham Milliken values the support of AuPS members, “It has been gratifying to maintain a relationship with so many AuPS members over such a long period of time. I appreciate the continued support from AuPS members and I hope that ADInstruments has been able to give something back through our sustaining membership of your society as well as our continued investment in innovative products that support the goals of members of Australian and international physiological societies. I would like to congratulate AuPS on its 50th anniversary and we look forward to further developing our relationship with your society and its members in the years ahead.”

ADInstruments PowerLab Data Acquisition System – 2009

AuPS Council Elections

The next Annual General Meeting (to be held in Sydney, 3rd January, 2010) will see a large turnover of Council membership.
David Adams is stepping down after 5 years service as President.
Stefan Bröer is stepping down after almost 5 years service as Treasurer.
Anuwat Dinudom's 3-year term as Editor also expires, as does Derek Laver's 3-year term as Webmaster and Dave Davey's 3-year term as IT Manager.
As Livia Hool, Giuseppe Posterino and Jamie Vandenberg were all elected as Councillors in 2006, their terms also finish at the next AGM.
Stefan Gehrig's 3-year term as Student Councillor also terminates.
We are greatly indebted to the enormous amount of work that all of these members have performed on the Society's behalf. The Society would not function without the efforts of these people. Although it will be a difficult and daunting task to replace them, we need to start considering it now. In the next few months, the National Secretary will instigate the following:

1. Seek nominations for Treasurer and hold an email ballot of the Membership.
2. Seek nominations for four regular Councillor positions and hold an email ballot of the Membership.
3. Seek nominations for Student Councillor and hold an email ballot of the Student Membership.
4. Seek a volunteer as Webmaster. This position is by 3-year appointment by Council.
5. Seek nominations for Honorary Membership.

The Council congratulates Dave Davey for his recent appointment as Editor. He will hold this concurrently with the IT Manager position to which he has just been reappointed for a further two years.
In addition to the above, the Council will identify a new Presidential nominee for election at the next AGM.
If you have ever considered offering your services to the AuPS Council, this is the year to do it!

PhD student and Postdoc publication prizes

Applications are now open for the annual Australian Physiological Society PhD student and postdoc publication prizes. Details concerning eligibility, how to apply and where to send applications can be found by following the links below. The crucial details are that the prizes and worth $500 each and the publication must have been published (on paper or online) between 30th September 2008 and 1st October 2009.

The application deadline is **31st October 2009**. Prize winners will be announced at the next AGM.

PhD student prize: http://www.aups.org.au/Prizes/PhDpublication.html
Postdoc prize: http://www.aups.org.au/Prizes/PostDocPublication.html

In last year's competition,
Dr Jonathon Schertzer (University of Melbourne) won the award for best postdoctoral publication.
Ms Sonja Kowalczuk (ANU) won the award for best student publication.

Awards,

THE A K McINTYRE PRIZE
SPONSORED BY SDR CLINICAL TECHNOLOGY

This prize, named in honour of the Society's first President, is awarded annually to members of the Society who are judged to have made significant contributions to Australian physiological science over their pre-doctoral and early post-doctoral years.

Applicants must be financial Ordinary Members of the Society, and must normally have completed their doctoral degree not more than 5 years prior to the time of their application (although they may apply during their 6th postdoctoral year). They must be proposed by two financial members of the Society, who should each provide a statement of not more than 500 words summarising their achievements. The applicant should also provide a curriculum vitae and a list of published works, including conference proceedings. The application deadline is **31st October 2009**. The prize winner will be announced at the AGM.

The Prize consists of a medal and the sum of $1000.

More information can be found on the following webpage:
http://www.aups.org.au/Prizes/McIntyre.html

Last years' prize was won by Dr James Ryall (University of Melbourne).

Applications are now open for student travel grants to attend the 5th Joint Meeting of the Societies for Free Radical Research Australasia and Japan to be held in Sydney, Dec 1 – 4, 2009.

Several awards will be made with values of $250 for students from Queensland, Victoria, Tasmania and New South Wales* and $500 for students from New Zealand or Western Australia.

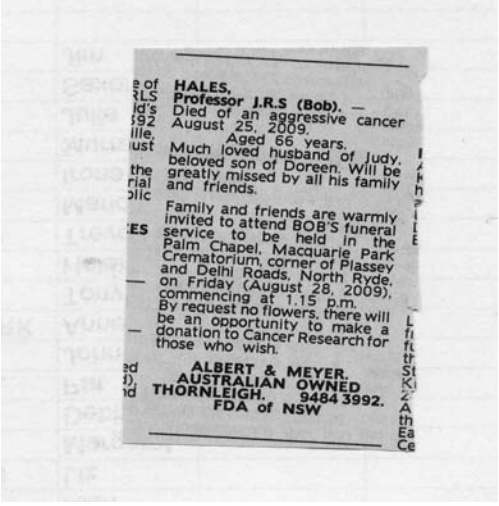
To apply, you must be a current financial member of SFRR Australasia and a student.

Please email a copy of your abstract, CV and a short covering letter by September 14 to:
Dr Mark Hampton, Secretary, SFRR (Australasia)
mark.hampton@otago.ac.nz

Please name the files you send as attachments with your surname, e.g. Abstract_Hampton, CV_Hampton, Cover_Hampton. Note that you will also need to submit your abstract on-line at the conference website:
http://www.redox-processes-sydney2009.org

Recipients will be notified by Oct 9. It is expected that recipients of travel grants write a report for the SFRR(A) to include on its website and newsletter.

Sadly



HALES, Professor J.R.S (Bob). — Died of an aggressive cancer August 25, 2009. Aged 66 years. Much loved husband of Judy, beloved son of Doreen. Will be greatly missed by all his family and friends.

Family and friends are warmly invited to attend BOB'S funeral service to be held in the Palm Chapel, Macquarie Park Crematorium, corner of Plassey and Delhi Roads, North Ryde, on Friday (August 28, 2009), commencing at 1.15 p.m. By request no flowers, there will be an opportunity to make a donation to Cancer Research for those who wish.

ALBERT & MEYER. AUSTRALIAN OWNED THORNLEIGH. 9484 3992. FDA of NSW

Obituary planned for the next issue

Sydney morning Herald

Redox Processes in Chemistry, Biology and Medicine

1-4 December 2009

University of Sydney
Veterinary Conference Centre

Abstract deadline 14th September 2009
Early bird registration closing 9th October 2009

http://www.redox-processes-sydney2009.org/index.htm

The 5th Joint Meeting of the Societies for Free Radical Research Australasia and Japan and the 11th Annual Meeting of the Mutagenesis and Experimental Pathology Society of Australasia

MEPSA

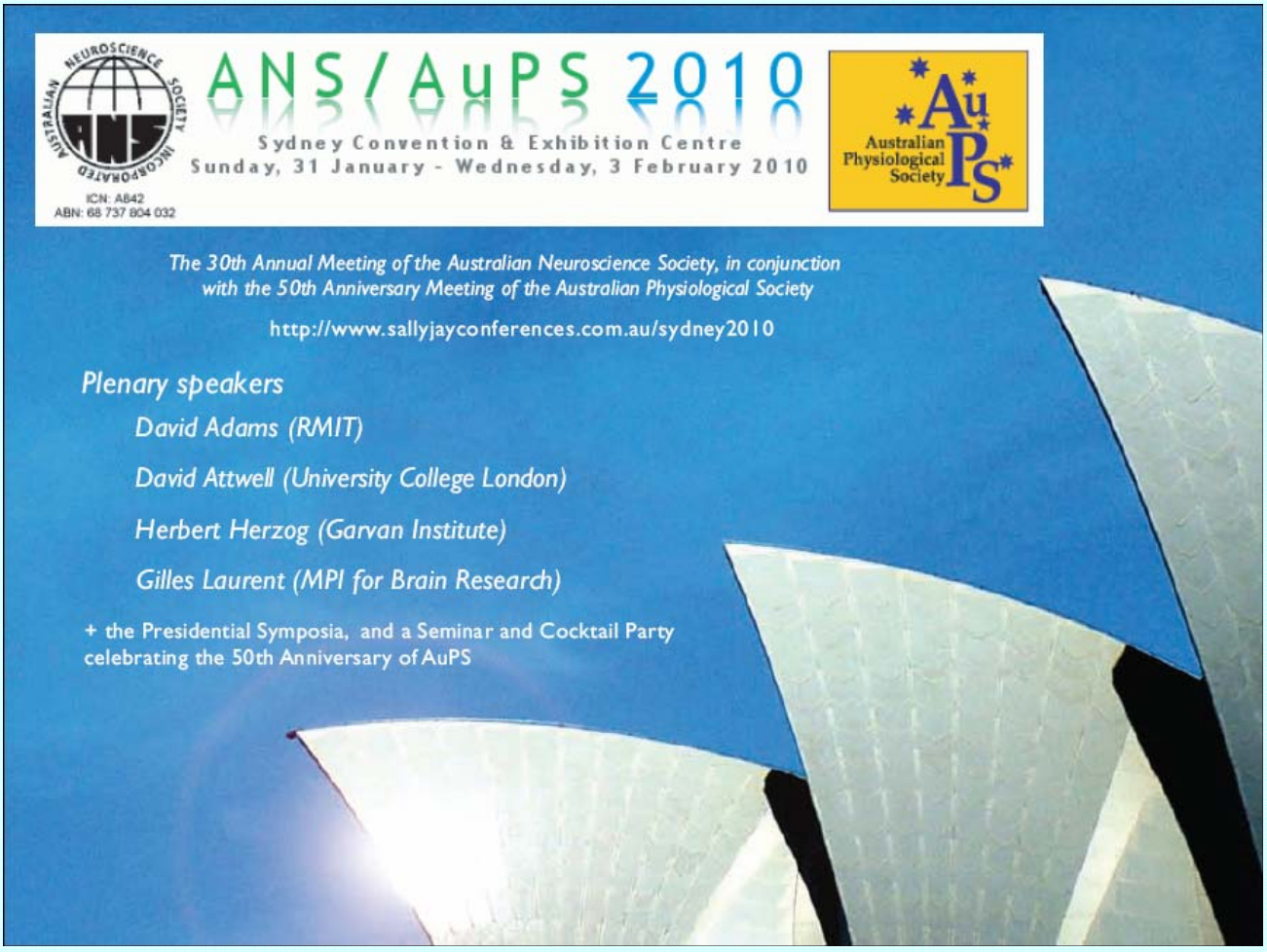
Have a *Eureka!* moment at ASB 2009

Sovereign Hill Ballarat

29 Nov. to 2 Dec.

Meetings in 2010

50th Anniversary Meeting

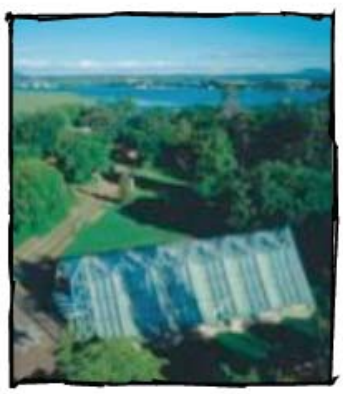


Something quite different – related to the article (above) “Reaching for the Higher Growing Fruit”

Have a *Eureka!* moment at ASB 2009

Sovereign Hill Ballarat

29 Nov. to 2 Dec.



Registrations Open Soon. Themes to include

* Ion Channels & Membrane Transport
* Protein Structure, Dynamics and (Mis)folding
* Muscle Biophysics
* Biophysical Characterisation Techniques
* Plant Biophysics and Photosynthesis
* Membrane Biophysics
* General Biophysics
* Cellular & Molecular Biophysics
* Bioengineering
* Molecular Modelling
* Biomaterials and Biomimetics

Plus Student and Young Biophysicist Awards!

See http://www.biophysics.org.au/ for details and updates

CEPP Clinical and Experimental Pharmacology and Physiology

SAPPHIRE BIOSCIENCE

SDR CLINICAL TECHNOLOGY

WILEY-BLACKWELL

ADINSTRUMENTS making science easier

AuPS Sustaining members

This issue of AuPS News has been compiled by Simon Potocnik with many thanks to the generous contributors. The next issue of AuPS News will be distributed to members in December 2009. All contributions for AuPS News should be sent by December 1st to: newsletter@aups.org.au.