

SINAPSE NEWSLETTER SEPTEMBER 2010

SCOTTISH IMAGING NETWORK A PLATFORM FOR SCIENTIFIC EXCELLENCE

SINAPSE SPR-ING AWARD

SINAPSE is pleased to announce it has been awarded £306k from the Scottish Funding Council to develop SPR-ING (Skills Programme for Research Imagers – the Next Generation). This programme will develop specialized skills for imaging scientists in key areas including image acquisition; image analysis and radiochemistry.

When added to the existing SINAPSE portfolio of training materials, this will provide a comprehensive training package to optimise skills of imaging researchers in Scotland and beyond via elearning. The need for these skills arises due to the current progress in translational imaging research.

A key feature of this training will be input from leading radiologists and clinicians with substantial knowledge of application of these techniques to both patient and research volunteers.

Development of the training starts this year and researchers will begin training in 2011.

SINAPSE ANNUAL SCIENTIFIC MEETING 2010 PRIZE WINNERS



Benson Mwangi Irungu, a PhD student at the University of Dundee, won the NEXXUS Prize for Best Oral Presentation for his work on “Computer Aided Diagnosis of Depressive Illness”. Benson is a first year SINAPSE PhD student and the judges were particularly impressed by his clear presentation and the amount of work and results achieved in such a short time. The NEXXUS Prize was presented by Colin Robertson of NEXXUS.



Dr Gordon Waiter, a SINAPSE funded senior lecturer at the University of Aberdeen, won the NEXXUS Prize for Best Poster Presentation for his work on “Repeatability and reproducibility of cortical thickness using DiReCT and the CaliBrain sMRI data”. The NEXXUS Prize was presented by Colin Robertson of NEXXUS.



Samantha Conlin, a medical student at the University of Edinburgh, won the British Institute of Radiology (BIR) Prize for Clearest Communication for her work on “A decade of DTI: what the advanced MRI technique of diffusion tensor imaging has taught us about the effects of cerebral gliomas on white matter tracts”. The BIR Prize was presented by SINAPSE Director Professor David Wyper.

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SEPTEMBER 2010 ISSUE

Special points of interest:

- SINAPSE Annual Scientific Meeting draws interest from across the UK. 160 people attend the second ASM in Edinburgh, page 2
- SINAPSE and the Royal College of Radiologists, sponsored by the Wellcome Trust, hosted a one day UK-wide meeting on Ethical Management of Research Imaging, see page 3.
- SINAPSE members host the international conference on NeuroReceptor Mapping (NRM 2010) in Glasgow, read the details on page 4.
- Neuroimaging and its use in law courts Read about the outcomes for the first part in a series of debates between imaging researchers, lawyers and lay representation on page 5.

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SINAPSE ANNUAL SCIENTIFIC MEETING 2010

On the 16th June 2010 SINAPSE held its second Annual Scientific Meeting at the Royal Society in Edinburgh. 160 delegates attended and the atmosphere was really buzzing with discussions around research and results that are beginning to emerge from the SINAPSE funded projects.



Delegates at Royal Society

The keynote presentation was by Professor Jeff Bulte from John



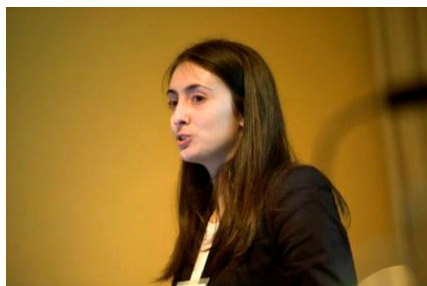
Professor Jeff Bulte



Professor Vin Cunningham

Hopkins, Baltimore USA on Stem Cell Imaging.

Professor Vin Cunningham, pictured above, has recently joined University of Aberdeen. He gave an invited talk on Kinetic Modelling in PET during the Molecular Imaging Session. Other invited speakers included Dr Lars Muckli, CCNi, Glasgow who gave an invited talk on "Imaging in Psychology" and Professor Christian Schwarzbauer from Aberdeen spoke on "fMRI: a new diagnostic tool?".



Adriana Tavares



Victoria Gradin

Several SINAPSE students were able to present the initial results of their research. Pictured are Adriana Tavares and Victoria Gradin both second year SINAPSE PhD students who gave talks.



Poster Session

There were 50 Poster presentations from students and staff in SINAPSE and also from presenters from around the UK.

You can see and download the posters and presentations on the SINAPSE website: <http://www.sinapse.ac.uk/media/events/asm.asp>

LATEST SPIRIT NEWS

The SINAPSE SPIRIT grant for Novel and Collaborative Approaches to Knowledge Exchange in Translational Imaging is now underway.

Twelve PHD students have been recruited to industry-linked SINAPSE SPIRIT studentships and they

will start in October. They will be joined by two students who will be joint SINAPSE-SUPA SPIRIT students based in Dundee. SUPA is the Scottish Universities Physics Alliance which is a research pooling that has research interests in life sciences.

SINAPSE is also pleased to announce that Andrew Robson started with SINAPSE on the 1st September to work as the SINAPSE Database Manager. He will work on cataloguing information across SINAPSE to optimize the cross centre communication and project work.

The following Universities are charitable bodies, registered in Scotland, with registration numbers as below.



ETHICS IN RESEARCH IMAGING MANAGEMENT

On the 1st July 2010, a group of imaging research experts including radiologists, physicists, imaging scientists, lawyers and policy makers, met at the Wellcome Trust in London to discuss the Ethics of Research Imaging Management.

The day was organized by SINAPSE and the Royal College of Radiologists; it was funded by the Wellcome Trust who also provided the venue. Professor Joanna Wardlaw, SINAPSE and Professor Alan Jackson, Manchester, organized the programme.

The first session covered “Frequency and type of incidental findings in neuroimaging” presented by Dr. Rustam Al Shahi Salman, MRC Clinician Scientist (UK); “Frequency and type of incidental findings in body imaging” presented by Professor David Lomas (UK); “Results of The Royal College of Radiologists’ survey of ethical aspects of

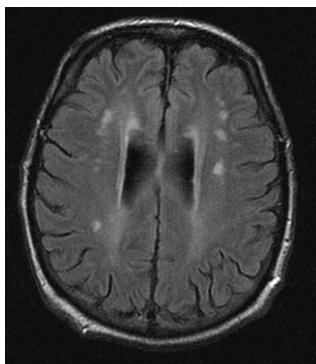


Professor Rüdiger von Kummer

research imaging” presented by Dr. Thomas Booth (UK).

The second session talks covered “Ethics of Research Imaging in Germany. Expectations of Researchers and Patients” by Professor Rüdiger von Kummer/Professor F. Hentschel (Germany); “Current UK legal and regulatory framework for research imaging” by Professor Graeme Laurie, Director

SCRIPT, (UK); “Expectations of research subjects and patients – The Ethics Committee perspective on how imaging should be handled in research” by Dr. Hugh Davies, National Research Ethics Committee (UK).



MRI image of the brain showing white matter ischaemia

The discussions following on from these talks raised a set of issues to be addressed. Below is an outline of these issues but a full report will be prepared in due course.

1 Transparency: Research Imaging Subjects in general want to know what their scan shows; existing guidance indicates that they should be told; ethics committees want to know that the research subject’s interests are protected; paternalism is out.

2 Expectations: the available studies (albeit limited) indicate that research participants expect that an appropriately experienced individual will look at their scan, even when told that the scan is not a diagnostic scan; most want to know if any potentially serious condition shows up (regardless of treatability); the Council for International Organizations of Medical Sciences, Code of Ethics and National Research Ethics Service state that everyone is entitled to know of findings related to health.

3 Duty of Care: researchers have a duty of care to participants although it is not clear if this is the same as for a doctor-patient relationship; the law expects “reasonable standard of care” but no test cases have occurred so dependent on views of a responsible body; rests on whether a breach of duty would cause harm.

4 Resources: in research imaging there is already a considerable regulatory burden. The aim should be to not add to this burden; more research is undertaken and many images are generated more than the available trained radiologists could look at; there are also financial, workload, information, and boredom issues to be considered.

5 Lack of evidence in some key areas: Research is needed about how best to do the research; Multiple areas have been highlighted where no information is available to inform practice.

6 Ethics committees: there is perhaps some variation in interpretation or understanding – clarification and guidance would be helpful.

7 Flexibility: One size does not fit all as the research question differs, population differs, researcher background differs and the location of scanner differs.

8 Evolving field: this is an evolving field the technology is developing, rights of the individual may change, medical knowledge is advancing.

This is a brief summary of the issues raised; the full report is in preparation and will be published on behalf of all participating bodies.

Contributors: Professor Joanna Wardlaw, Dr Janet De Wilde

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NeuroReceptor Mapping Congress 2010 Glasgow

The eighth NeuroReceptor Mapping Congress was held under the auspices of SINAPSE at the Hilton Hotel in Glasgow from 22-24 July. It was attended by 272 delegates from North America, Japan, and Europe. Around 80% of the delegates were from academic institutions and 20% were participants with an industrial base.

The meeting opened with a keynote lecture by Professor Vic Pike. Vic is a radiochemist, who started his career at the Cyclotron Unit at the Hammersmith Hospital and is now a Senior Investigator at the Molecular Imaging Branch of the National Institute of Mental Health (Bethesda, USA), and Chief of the PET Radiopharmaceutical Sciences Section. The core scientific interest of this Section is to discover and evaluate new radiotracers for imaging specific molecular targets (neurotransmitter receptors, transporters or enzymes) in animal and human brain with PET (positron emission tomography) for eventual application in neuropsychiatric research. Radiotracers for TSPO sites, mGluR5, CB1 receptors and P-gp have recently been developed there and are in use for clinical studies. Importantly, Vic pointed out that there can be major species differences in the properties of tracers. Taking them straight to human application would be ideal if legislation permitted.

Presentations were divided into 4 themes: Synaptic Imaging, Novel Tracers, Methodology and 'Neuroinflammation/amyloid and other targets'. Platform presentations were awarded to the abstracts with the highest ratings from the International Scientific Advisory Committee and were of an extremely high standard. Parallel sessions, the curse of many conferences, were avoided by putting a strong focus on poster presentation. This worked well.

The standard of the posters was excellent, perhaps stimulated by the generous donation of 5 poster prizes by Nexus Scotland. One of these was for the poster with the best lay summary, a very important component of research. Perhaps not surprisingly, this was won by a

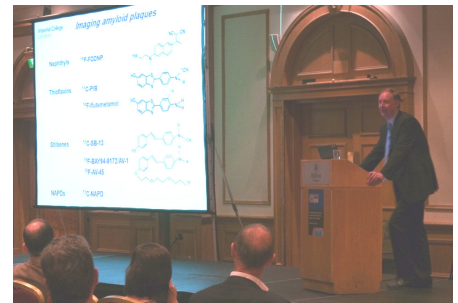


Poster Presentations

group who do not have English as their first language. Mette Haahr from Copenhagen had the clearest summary of her study showing that 5-HT4 receptor binding in hippocampus and pre-frontal cortex is not associated with long-term memory test performance. Negative studies can be just as important [and rewarding] as positive ones. SINAPSE student Adriana Taveres was shortlisted in the top 5 in this category for her work on (R,S)-2-Iodo-reboxetine, a novel SPECT tracer for the noradrenaline transporter in brain.

GSK funded 5 young investigators awards, young defined as less than 5 years post doctoral. The awards were based on the scoring of abstracts by the Scientific Review Committee and were won by delegates from the Netherlands [2], Germany, Austria and USA.

The meeting was rounded off splendidly by Professor David Brooks. David is Hartnett Professor of Neurology and Head of the Department of Clinical Neuroscience in the Division of Experimental Medicine, Imperial College London. He is also Head of the Neurology Group at the Medical Research Council



Professor David Brooks

Clinical Sciences Centre, Hammersmith Hospital, London. His research involves the use of PET and MRI to study the biochemical and pharmacological changes that occur in Alzheimer's and Parkinson's diseases and as biomarkers to assess the efficacy of novel therapeutics. David introduced the harsh reality of clinical practice and demonstrated the value of neuroreceptor mapping research for patients. He demonstrated that patients with Parkinson's Disease were now diagnosed with high accuracy, that we are on the threshold of diagnosing Alzheimer's Disease with high accuracy and that PET tracers are essential markers of the action of therapeutic interventions in a host of neurological conditions.

These meetings are held every second year and alternate between Europe and North America. At each meeting delegates vote for the next destination. Scotland was selected ahead of Manchester and Vienna as the 2010 venue following voting in 2008 at Pittsburgh. Unfortunately this time only one Centre put in a bid to host the 2012. The 2012 meeting will be hosted by Johns Hopkins University in Baltimore. Let's hope that we have a host of SINAPSE presentations.

Contribution by Professor David Wyper, Dr Sally Pimlott, Dr Jonathan Owens.

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Part 2 of “What are we thinking? Who has the right to know?”

On the 7th and 8th of June 2010 a group of 37 lawyers, judges, philosophers, political scientists, Church representatives, sociologists, neuro-radiologists, neuroscientists, psychologists, physicists and bioethicists met at the Institute for Advanced Studies, University of Strathclyde, Glasgow, for the second part of the debate on Brain Imaging and its Impact on Society, “What are we thinking? Who has the right to know?”. This second part examined the legal view. Part 1 had looked at the imaging aspects and the outcome of this is reviewed in the June 2010 SINAPSE newsletter.



Professor Hank Greely

Invited speaker Professor Hank Greely, Deane F. and Kate Edelman Johnson Professor of Law, University of California Santa Barbara and Co-Director of the MacArthur Law and Neuroscience Project, USA, spoke on “Mind reading” and gave a public lecture in the evening on “Neuroscience, Law, and Society - The Coming Revolution.

“The View from the Bench” lecture was given by Judge Jed Rakoff, United States District Judge for the Southern District of New York.

After two days of expert talks, panel question and answer sessions, consideration of exemplar court cases, discussion groups and exercises to construct a series of frequently asked questions for lawyers and neuroscientists, the first 9 points of the summary conclusions of the



Judge Jeff Rakoff

group are listed below:

1 Due to the importance given to mental states in legal decision making, from the insanity defence to perjury prosecution, the temptation to use results from neuroscience in a legal context will be high.

2 There was general consensus among the legal professionals present that there is currently little place for use of brain imaging in court to establish a diagnosis of mental illness, for lie detection, to determine intent, personal preferences or behavioural traits.

3 Attempts to replace core legal concepts such as intent by neuroscience based vocabulary, let alone giving up the notion of personal responsibility or free decision making on which the criminal law depends, are very premature

4 More generally, there is a danger that an “illusion of knowledge” is created with little guidance or insights how to use this knowledge responsibly, or indeed what to do with it at all. This is potentially dangerous for public discourses about risks, such as the risk of offending, the risk to suffer from an illness etc.

5 There is a risk that results are used that have little to no ecological validity in forensic settings. The use of images addition carries the risk of being prejudicial when used in front of a lay jury without scientific training. Dedicated

forensic research, and research into communication of these results, is needed.

6 The experience for the US indicates that a principled approach to the admissibility of evidence provides some efficient safeguards, but also shows that commercial operators of debatable quality will soon become active in legal fields such as employment disputes or criminal sentencing/parole board decisions etc where these safeguards do not apply.

7 For the UK, reviving the idea of a “Forensic Science Advisory Council” as suggested by the “Forensic Science on trial report” by the House of Commons to act as gatekeeper for new types of evidence would be a useful approach also to regulate neuroscientific evidence.

8 Learning from the experience in computer forensics regarding e.g. standardisation of tools and equipment would be beneficial, as would be standards for presenting neuroscientific evidence in court (e.g. there is no need to present the actual images in fMRI evidence)

9 In addition to the reliability of the evidence, other factors too need to be taken into consideration, in particular privacy concerns - this debate is in its infancy so far in the US and UK, but more developed in Germany and France.

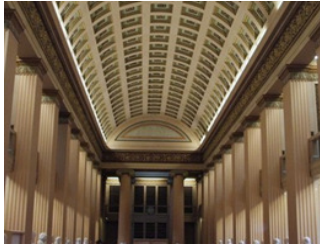
The above is a summary and for the full report and further details of these debates including lectures, videos and reports please see the SINAPSE website.

www.sinapse.ac.uk/media/events/ias.asp

Contributors:
Professor Joanna Wardlaw,
Burkhard Shafer,
Dr Janet De Wilde



SINAPSE AND IMAGING EVENTS SEPTEMBER TO DECEMBER 2010



Playfair Library, Edinburgh

SINAPSE SPIRIT TRANSLATIONAL IMAGING SEMINAR

23 September 2010: SINAPSE will be hosting a Translational Imaging workshop in University of Edinburgh, Playfair Library. This is the first of six translational imaging seminars to be held under the SPIRIT project. See SINAPSE website for details.

BRAIN IMAGING & SOCIETY DEBATE—PART 3

29 September 2010: Final Politicians Debate of Part 3 of "Who has the right to see your brain images" will take place Scottish Parliament in Holyrood, Edinburgh organised by the Scottish Futures Forum, SINAPSE, Edinburgh Neuroscience and SCRIPT.



The Burn, Angus

SINAPSE WORKSHOP on MR SPECTROSCOPY

20 October 2010: Student run workshop on MR Spectroscopy at the Institute of Neurological Sciences, Southern General Hospital, Govan Road, Glasgow. Registration is free. To register email m.shokouhi.1@research.gla.ac.uk mentioning your name, post, affiliation & course.

SINAPSE PhD STUDENT INDUCTION

27-29 October 2010: SINAPSE will be hosting its annual student induction at the Burn, Angus. This year SINAPSE will be welcoming 22 new students. See SINAPSE website for details.



Institute of Medical Sciences, Aberdeen

IMAGING in DEMENTIA & COGNITIVE IMPAIRMENT

16 November 2010: SINAPSE and Centre for Cognitive Ageing & Cognitive Epidemiology will be hosting an Imaging in Dementia and Cognitive Impairment Seminar at Institute of Medical Sciences, University of Aberdeen. See SINAPSE website for details.

EVENT-RELATION POTENTIALS HANDS-ON WORKSHOP

25-26 November 2010: This two-day EPS-funded workshop "Promoting Excellence in the use of Event-Related Potentials in Psychological Research: A Hands-on Neuroimaging Workshop" is aimed at graduate students and junior scientists who are just beginning to use ERPs in their research. The workshop will cover key aspects of ERP design, processing and analysis with a mixture of lectures and hands-on practice, including keynote talks from international ERP experts. A limited number of travel bursaries will also be available. Location: Department of Psychology, University of Stirling, Scotland. For more details please email: ceuk@stir.ac.uk



University of Stirling

UK STROKE FORUM—GLASGOW 2010

30 November - 2 December 2010: The 5th UK Stroke Forum Conference 2010 will take place at the SECC, Glasgow. Please see <http://www.ukstrokeforum.org/index.html>

SINAPSE IMAGE ANALYSIS SOFTWARE TOOLS

SINAPSE is collating information on image analysis software expertise across the SINAPSE network. The purpose is to have a database detailing users of specific software and their areas of expertise to provide a useful resource enabling members to identify

others within the network who can help them with a specific image analysis issue. A summary of the information collected so far can be downloaded as a MS Excel file from the Online Research Tools section of the SINAPSE website (see web address below).

We encourage submissions/ additions from others within the network (staff or students), so if you would like to be included please download a copy of the Excel sheet, add your details under the relevant headings, and send your submission to paul.armitage@ed.ac.uk

<http://www.sinapse.ac.uk/documents/researchtools/image-analysis-expertise.xls>

Produced for SINAPSE by Dr Janet De Wilde, SINAPSE Executive Manager. Any comments on this newsletter please send to Janet by phone on 0131 651 1735 or email on janet.dewilde@ed.ac.uk

Do you have something to contribute: deadline for submissions to the next newsletter is 22 November 2010



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