

**SINAPSE SPIRIT Translational imaging seminar
Edinburgh Playfair Library, Old College, Edinburgh
23 Sept 2010**

Report Author Prof Ian Marshall and Dr Janet De Wilde

The first SINAPSE SPIRIT seminar was held in the Playfair Library at University of Edinburgh on the 23rd September 2010. Seventy nine attendees from both industry and universities came together to discuss Translational Imaging. We were privileged to have two internationally renowned keynote lecturers, talks from staff and students from SINAPSE. There was also a poster exhibition (see pictures below).

The meeting began with an excellent overview of the use of preclinical imaging in drug development by Dr John Waterton (AstraZeneca). John explained how many potential drugs have failed to show real benefits in clinical trials, and that the cost of these programmes can be up to \$1B each. There is now a concerted effort to validate every step of drug discovery (e.g. that molecules reach the correct target; bind to the appropriate receptor; modulate the pathways; alter the physiology) with lab tests so as to control these huge costs.

Dr Malcolm Macleod (Edinburgh) followed on very neatly, describing a meta-analysis of preclinical studies of neuroprotective drugs in stroke models. The concentration on structural rather than functional outcome in many of those studies may partially explain why their apparent success has not been translated into the clinic. Both structural and functional biomarkers are necessary.

Professor Keith Muir (Glasgow) described an oxygen challenge test for identifying the ischaemic penumbra in stroke patients. Current MR and CT measurements of “perfusion” do not provide reliable definition of the penumbra, which is vital before thrombolytic drugs can be given safely. The penumbra in animal models of ischaemia was further discussed by Emma Reid (Glasgow) and Tracey Baskerville (Glasgow). Emma presented work in hypertensive rats, which showed larger initial ischaemic injury than did wild types. Again, the difficulties of identifying and quantifying penumbra were discussed. Tracey showed that male rats developed larger lesions than female rats although CBF values in the penumbra were similar between the sexes. It is possible that sex hormones influence the severity of the insult.

The second keynote speaker, Dr Mark Lythgoe (University College London) gave a fascinating overview of advanced techniques being developed by his group. Of particular interest were the attempts to “steer” iron-oxide particles using the scanner’s magnetic field gradients. This could be used in the delivery of stem cells, for example. Mark also described the simultaneous 3D microscopic imaging of many mouse embryos for phenotype screening. Automated image analysis is crucial to achieve a reasonable throughput.

Dr Mark Bastin (Edinburgh) described the translation of diffusion tensor imaging (DTI) and magnetisation transfer imaging (MTI) from human to rodent for the study of white matter integrity. The small size of rodent brains and their relatively low proportion of white matter make this translation challenging.

Dr Roger Staff (Aberdeen) described the use of SPECT imaging to study rCBF in Alzheimer patients who had been given a placebo or a therapeutic drug (MTC). The study was able to show that a particular dosage of the drug gave the optimal (i.e. least) reduction in rCBF over the course of 24 weeks.

Prof Andy Welch (Aberdeen) described progress in translating PET imaging from clinical to mouse studies. Challenges are posed not only by the small size of the mouse brains, but also by their low uptake of FDG tracer, the effect of anaesthetic, and the difficulty of controlling the animals during the uptake period.



Metrics Report by Dr Janet De Wilde

Table 1 Registrants, analysis of staff type and student type

Number	Category
79	TOTAL Registrants (24 of which were SINAPSE)
Total 59	Staff (breakdown below)
9	Company staff
28	Research staff, 3 SINAPSE
9	SINAPSE Executive inc 6 Professors
7	Professors (13 if include SINAPSE 6)
5	Business development
1	Government
Total 20	Students (breakdown below)
9	SINAPSE Spirit Students
3	SINAPSE Students (non Spirit)
8	Non SINAPSE Students

Table 2 Companies involved; analysis of number of staff attending

Number of Staff Registrants	Company
1	AstraZeneca
2	GE Healthcare
2	ReNeuron
3	TMVSE
1	Agilent Technologies