

Singapore International Neuroscience Conference (SINC)

- Continuing Excellence in Neuroscience Research

With a brand new name to better embrace the endeavours of the organising committee, the NNI-NUS Neuroscience Symposium continues its chapter this year with a warm reception and a good measure of success.

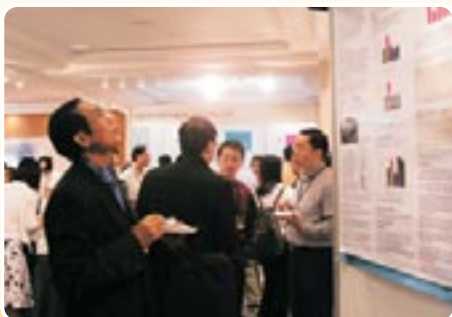
The NNI-NUS Neuroscience Symposium first held in 2002 is now known as the Singapore International Neuroscience Conference (SINC). Jointly organised by the National Neuroscience Institute (NNI) and the National University of Singapore (NUS), 2nd SINC took place at the TTSH Theatre from 22-23 July 2004.

As in the previous symposium, the overall objectives of the SINC are to feature NNI and NUS as centres of excellence for neuroscience research in Asia and to stimulate and invigorate greater interest in neuroscience research in Singapore. The meeting also aims to support our Government's Life Sciences initiative. The 2-day conference attracted more than a hundred local and regional participants, warmly welcomed by A/Prof Lee Wei Ling, Director of NNI, at the opening ceremony.

Entitled "Mechanisms, Models and Medicine", the 2nd SINC seeks to better understand disorders afflicting the brain and nervous system. It covered four main themes: (1) Epilepsy, Pain & Cognition; (2) Ion Channel and Receptor Function; (3) Genetics and Mechanisms of Neurodegenerative Disorders, and (4) Neural Stem Cells. The title of the conference amply reflects the logical, albeit often painstaking, progression of efforts required to translate bench discoveries into tangible bedside therapies. Conference Guest-of-Honour, Professor Tan Ser Kiat, SingHealth Group CEO, aptly put across to the audience, "It is estimated that it would take an average of 17 years to bring significant research findings to positive clinical application on the international scene today". Hence, he urged all scientists and clinician-scientists to collaborate

closely to bring findings from the bench to bedside quickly, safely and efficiently.

An international panel of renowned neuroscientists from the USA, Canada, Europe and Asia, as well as a group of talented experts from various biomedical organisations in Singapore met to discuss the different aspects of brain function and dysfunction at the 2-day conference. Research work carried out in the laboratories of many our distinguished guests, including Dr Therese Jay (Hospital Sainte Anne, France), Professor Terrance Snutch (Neuromed Technologies, Canada), Professor Li Lingsong (Peking University, China) and Mr Loke Weng Keong (Defence Science Organisation, Singapore) also received keen media attention in our local press.



Faculty and delegates mingling in the exhibition hall among trade booths and poster exhibition.



Guest-of-Honour Prof Tan Ser Kiat, Group CEO, SingHealth (front row, middle) having a chat with A/Prof Lee Wei Ling, Director, NNI. Organising Chairman, Dr Lim Kah Leong seated to his left.



Organising Chairman, Dr Lim, with a question for the guest speaker.

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highlights

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National
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Overall, the biennial conference was a success in many ways. Besides keen audience participation, 2nd SINC has helped foster new friendships, renewed old ties and potentiated multilateral collaborations amongst local and overseas researchers. On this note, we certainly look forward to welcoming all of you to the 3rd SINC in year 2006.



A parting shot of the organising committee and faculty after a successful conference.

NNI Research Student Interns Win Coveted NP Technology Award

Two students from Ngee Ann Polytechnic (NP) who have done their internship research project under the supervision of Dr Lim Kah Leong, Principal Investigator, NNI Research Faculty, have won the 2004 Ngee Ann Polytechnic (NP) Technology award.

Ms Eng Pei Woon and Ms Constance Chew, both students from the School of Life Sciences and Chemical Technology at NP, beat fellow school mates from their entire cohort to emerge as winners for the coveted title. According to Dr Phang Chiew Hun, Deputy Director, School of Life Sciences and Chemical Technology, NP, "The student excellence day award has been presented annually since 2002. It serves to recognise our students' achievements in various fields, ranging from community service, the arts, and technology to sports and CCA contributions. Graduating students from various departments at NP compete yearly for the technology award"

Dr Lim, who heads the Neurodegeneration Research Lab at NNI, was obviously very pleased with the stellar performance of his interns. He remarked, "I am absolutely delighted that my first pair of student interns did so well in their project to be recognised by NP, particularly when they faced stiff

competition for the award from their classmates who did their internship in more established laboratories and institutions."

Pei Woon and Constance have participated in a research project in Dr Lim's laboratory that led to an important discovery about how mutations in parkin, a familial Parkinson's disease-linked gene product, alter the protein solubility and intracellular localisation, thereby rendering the protein non-functional (Fig 1). As parkin serves as a multipurpose neuroprotective agent, alterations in parkin properties could result in the death of dopaminergic neurons seen in Parkinson's disease. Their results have been presented in numerous conferences, both local and overseas, and a manuscript is due for submission to an international peer-reviewed journal at the end of this month. Constance had also won an award at NP for her poster presentation earlier this year.

Since its inception, the NNI research department has been hosting student interns from various polytechnics every year. The internship is performed as part of the student

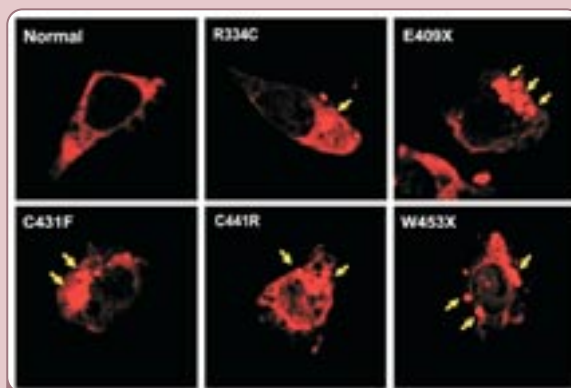
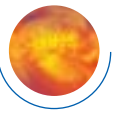


Fig 1: Showing the intracellular localisation of normal and mutant parkin proteins (stained red). While normal parkin distributes uniformly in cells, disease-associated mutations on parkin produce aggregation within cells, rendering the protein non-functional.

industrial attachment program. Laboratories keen to take in student interns from NP could contact Dr Phang Chiew Hun at pch@np.edu.sg

Dr Lim Kah Leong with happy award winners, Ms Eng Pei Woon (L) and Ms Constance Chew (R).





Rapid and High Resolution Anatomical MRI Scans for the Clinic

■ Mrs Lynn Ho, Research Fellow, Neuroradiology

A | dvent of High Field MR Systems

Clinical high field MRI (3 Tesla) systems with multiple-channels and parallel-imaging capabilities have only recently become available with the approval of certain 3T systems for clinical use in 1999 by the U.S. Food & Drug Administration (FDA). In May 2002, the Neuroradiology Department in NNI became the first centre in Southeast Asia to operate such a 3T MR scanner. This state-of-the-art scanner is currently being used routinely for clinical examinations and research.

Such high field MR systems have presented many new possibilities for clinical imaging. In particular, it is now possible to fully utilise the gain in signal-to-noise ratio provided by the increased field strength to increase the spatial resolution of anatomical scans suitable for quantitative morphometry, while keeping the total acquisition time within clinically relevant limits.

Anatomical Scans of 0.9mm³ Resolution in Only 5 Minutes

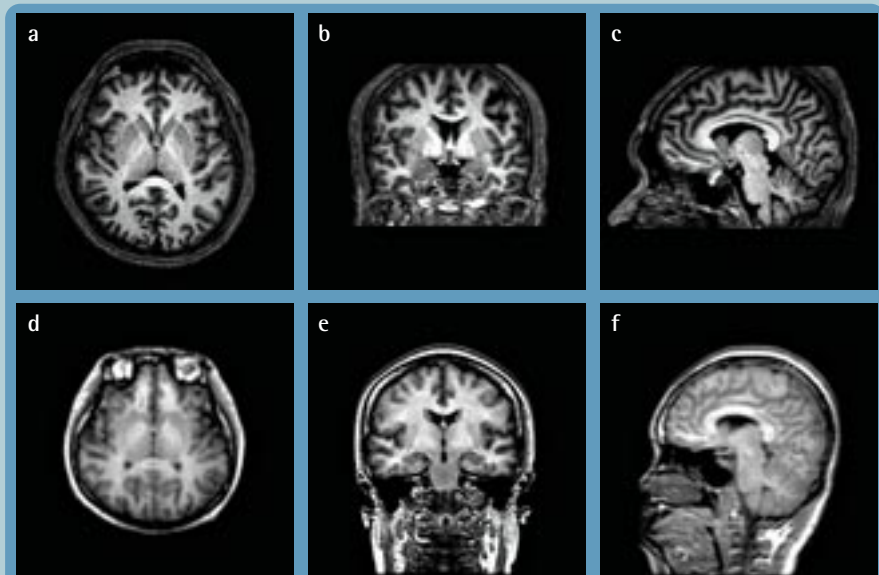
Most conventional 3D anatomical scans of the brain take 10 minutes or more, a relatively long time for any patient, who typically requires at least a few other scans in the same session. Keeping still for long periods in a small scanner bore with likely additional discomfort from illness presents difficulties for most patients. In addition, the resulting scan images usually suffer from motion-related corruption due to the long scan times and small voxel size. At the Neuroradiology Department, we set

out to reduce the amount of scan time while achieving sub-millimetre resolution.

Dr Xavier Golay, an MR physicist working as Principal Investigator in the department, optimised an existing sequence – a 3D magnetisation-prepared rapid acquisition with a gradient echo (MP-RAGE) sequence, for use at 3T and combined it together with a fast parallel imaging readout method using the sensitivity encoding (SENSE) capabilities of a multi-coil array. The use of SENSE allowed for the reduction in scan time, while the high signal-to-noise ratio was utilised to increase bandwidth for good resolution.

With this sequence, an isotropic, whole-brain sub-millimetre acquisition (0.9 x 0.9 x 0.9mm³) was achieved in only 5 minutes, which is faster and at a higher resolution than any other conventional scan currently in use. Additionally, these axial scans can be reconstructed in either the coronal or sagittal planes as they were acquired using an isotropic acquisition scheme. See Figure 1.

The results of this optimised sequence were presented at the 12th Meeting of the International Society of Magnetic Resonance in Medicine (ISMRM) in May 2004 in Kyoto, Japan.



■ Comparison of the new MP-RAGE scan with conventional scan acquired at 1.5T:

(a) 5-min isotropic (0.9mm)³ MP-RAGE scan with native axial orientation showing fine mesial temporal structures like the hippocampus, shown in (b) reformatted in the coronal plane, and in (c) reformatted in the sagittal plane; (d) 5-min conventional T1-weighted 3D scan acquired at 1.5T coronally with a resolution of 0.9 x 0.9 x 3mm³ and reformatted in the axial plane, shown in the native acquisition in (e) and reformatted in the sagittal plane in (f).

While there is a slight broadening of the point spread function, the visible quality of the MP-RAGE scan and its contrast are better than the conventional scan, even if the resolution is more than 3 times better in this case.

Decompression of Hemifacial Spasm with Intraoperative Monitoring Guidance using Electromyography and Brainstem Auditory Evoked Response

Dr Chua Hoe Chin, Consultant, Neurology

It is now well established that idiopathic hemifacial spasm is caused by vascular compression of the facial nerve at its root exit zone. Over the last 3 decades, microvascular decompression had proved to be a valuable procedure to definitively cure the disease.



Fig 1. Branches of facial nerve in the face.

The facial nerve has 5 branches in the face: temporal, zygomatic, buccal, mandibular and cervical (Fig 1). In a normal person electrical stimulation of a branch, for instance the zygomatic, causes contraction only of the orbicularis oculi muscle due to orthodromic conduction. In hemifacial spasm, stimulation of one branch also elicits contraction of other muscles which are not supplied by that branch. This constitutes the anomalous muscle response or lateral spread response.

This phenomenon is due to abnormal axonal activity at the facial root exit zone secondary to compressive damage, inducing hyperexcitability of the facial nucleus. As a result electrical stimulation of a branch elicits antidromic conduction to the brainstem and facial nucleus with orthodromic conduction to the other branches of the facial nerve.

There is a 10 to 15% risk of hearing loss during microvascular decompression. Monitoring with brainstem auditory evoked response (BAER) during surgery can decrease this risk. Prior to the use of BAER, the incidence of postoperative hearing loss was 11.9%, with 6.8% of patients having no residual hearing function. With the use of BAER 6.7% of patients had mild to moderate hearing impairment and no patient developed complete hearing loss.

Preoperatively we obtain BAER (Fig 2) and facial nerve electromyogram (EMG) recordings in the Electrodiagnostics Laboratory. We stimulate the zygomatic branch of the facial nerve and obtain orthodromic and antidromic responses from the frontalis and oris muscles respectively (Fig 3). The same setup was used for intraoperative monitoring. Baseline EMGs were recorded prior to decompression (Fig 4). During surgery



Fig 2. Preop BAER.

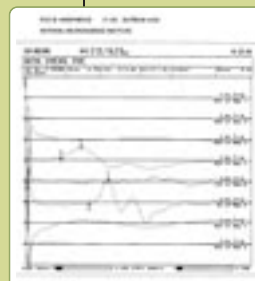


Fig 3. Preop facial nerve EMG (trace 4 = frontalis; trace 6 = oris).

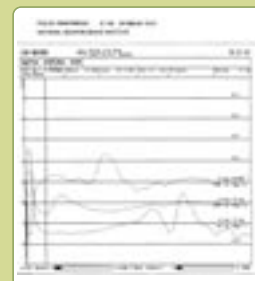


Fig 4. Baseline facial nerve EMG (upper trace = frontalis; middle trace = oculi; lower trace = oris).

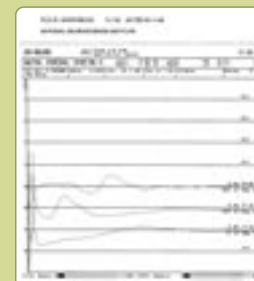


Fig 5. Absence of anomalous muscle response (lower trace) from oris with adequate decompression (upper trace = frontalis; middle trace = oculi).



Fig 6. Normal intraoperative BAER.

the offending artery was identified and EMG recordings were obtained continuously during lifting and mobilisation of the artery. Several pieces of Teflon were inserted between the artery and facial root exit zone. Disappearance of the anomalous muscle response (Fig 5) provides electrophysiological evidence of adequate decompression of the facial nerve. BAERs were normal throughout the procedure with no significant latency or amplitude changes (Fig 6).

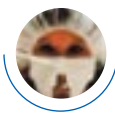
To summarise, intraoperative EMGs are useful to guide the surgeon in adequate decompression in hemifacial spasm. Concomitant BAER decreases the incidence of postoperative hearing loss.

Department of Neurology (TTSH Campus) Weekly Teaching Schedule

The programme is open to all doctors.

EVENT	TIME	VENUE	CONTACT PERSON	CONTACT NUMBER
"Pantry" Round (discussion of clinic cases)	Monday, 1:00 – 2:00pm	NNI Level 3, Clinical Staff Office Pantry	Dr Daniel Oh	6357-7171
EEG Teaching Round	Tuesday, 7:30 – 8:30am	NNI Level 1, Neurodiagnostic Suite	Ms Chang Chao Li	6357-7070
Neurology residents' tutorial by Dr S C Loong *	Tuesday, 12:00 – 1:00pm	NNI Level 1, Patient Support Room	Dr Richard Chua	6357-7171
Neuroradiology Round *	Wednesday, 8:15 – 9:00am	NNI Level B1, Neuroradiology Conference Room	Ms Haslinda Salim	6357-7033
Movement Disorders Video Round	Wednesday, 12:30 – 1:15pm	NNI Level 1, Neuroscience Clinic Room 9	Dr Louis Tan	6357-7171
Neuromuscular Round *	1 st Thursday of the month, 12:30 – 2:00pm	NNI Level 1, Patient Support Room	Dr Wong Yee Choon	6357-7171
Journal Watch *	2 nd and 3 rd Thursday of the month, 1:00 – 2:00pm	NNI Level 1, Patient Support Room	Dr Tan Kevin	6357-7171
Neurology Updates *	4 th Thursday of the month, 1:00 – 2:00pm	NNI Level 3, Clinical Staff Office Conference Room	Dr Louis Tan	6357-7171
Dr S C Loong - Grand Round *	Thursday, 2:00 – 3:30pm	NNI Level 1, Patient Support Room	Dr Richard Chua	6357-7171
Neuro-Ophthalmology teaching by Dr S C Loong	Thursday, 3:45 – 4:45pm	NNI Ward 10A, Tutorial Room	Dr Richard Chua	6357-7171
Stroke Teaching Round	2 nd and 4 th Thursday of the month, 4:00 – 5:00pm	TTSH Ward 10A, Tutorial Room	Dr R Singh	6357-7171
EMG Teaching Round *	Friday, 12:30 – 1:30pm	NNI Level 1, Neurodiagnostic Suite	Dr Nagaendran	6357-7171
Neurology Grand Round *	Last Friday bi-monthly, 5:30 – 7:00pm	NNI Level B1, Neuroradiology Conference Room	Dr Lim Shih Hui	6357-7171

* CME points awarded



Enhancing Quality of Life for Brain Tumour Patients

■ Ms Emily Ang, Nurse Clinician, Neuro-Oncology

When someone is diagnosed with a brain tumour, the reality for the patient and the family may be too fearsome to grasp. Besides having to cope with the diagnosis, patients have to face the decision for surgery and undergo further treatments like radiation and/or chemotherapy. All these experiences are painful and sometimes overwhelming for them.

Neuro-oncology nursing is a specialised field which requires a multidisciplinary team approach in meeting the needs of brain tumour patients. It was my privilege to

be awarded a 7-week Neuro-oncology Management HSDP attachment at 5 renowned hospitals in the United States - M.D. Anderson Cancer Center, Massachusetts General Hospital, Brigham and Women's Hospital, Dana Farber Cancer Institution and Beth Israel Deaconess Hospital. Generally, brain tumour patients in the United States are more proactive and aggressive towards their treatment.

The attachment has broadened my perspective on Neuro-oncology nursing and encouraged me to critically evaluate

current nursing practices and approaches in patient education. In addition, I have learnt that it is important to use creativity in delivering personalised patient education. Currently, I am developing educational materials and programmes both for nurses and patients. Through this, I hope to enhance the nurses' knowledge on brain tumour patients and complement the Neuro-oncology team in improving the quality of life for brain tumour patients in Singapore.

Keeping Your Memory Sharp – Dementia Nursing

■ Ms Esther Vanessa Chua, Nurse Clinician, Dementia

Dementia nursing is liken to the famous Forrest Gump saying, "Life is like a box of chocolates. You'll never know what you get." It is full of different challenges and surprises. Many people think that memory problems of the elderly are just the norms of growing old, but that is not the case. For the past year as a Dementia Nurse Clinician, I have realised how much misconception the public, patients and families have about the disease. I also observed the tremendous amount of stress and the lack of support for caregivers.

It has been my privilege to be sent to the United States as part of my training. I was able to observe the organisational structure and functioning of the various dementia programmes. I was attached to University of California Los Angeles (Reeds Medical centre), University of California San Diego Alzheimer's Disease Research Centre and SOCARE (Seniors Only Care) and Washington University Alzheimer's Disease Research Centre.

I observed certain similarities between our overseas counterparts and us. Though we

might be culturally different from them, the issues we face in dementia care are similar. Some of the issues faced are lack of knowledge about the disease, the care for dementia patients and creating awareness to the minority population.

The 8-week attachment was an eye-opener for me. It has enhanced my role in educating the public, patients, families, caregivers and health care professionals about dementia.



In Celebration of Nurses – Past, Present and Future

■ Ms Mary Law, Assistant Nurse Manager, Nursing
 Ms Emily Ang, Nurse Clinician, Neuro-Oncology Nursing

2 | 6 July 2004 was NNI’s 6th Nurses Day, celebrated for the first time under the umbrella of the SingHealth cluster. Themed “Nurses in the Past, Present and the Future”, the celebration was focused on our nurse clinicians.

Two weeks before the event, all nurse clinicians were roped in to assist with the planning and logistics of the day. Throughout the entire preparation, it was heartening to see a demonstration of unity not only during the ‘bad times’ (SARS outbreak) but during the good times as well.



■ Mdm Loke Wai Chan, NNI Director of Nursing (4th from Left) in a happy shot with TISH ward nurses.

The day of anticipation finally arrived and the hall was looking beautiful with colourful balloons. The presence of SingHealth Group CEO, Prof Tan Ser Kiat added to the joy and excitement. The celebration began with an opening address by Madam Loke Wai Chan, Director of Nursing. She praised the nurses for their achievements and inspired them to a better future, with continued excellence in neuroscience nursing in education and research, in Singapore as well as regionally.

Naturally, the celebration would not be complete without the usual feasting, fun, games and lucky draws. Guests had fun guessing ‘who’s who’ from a collection of old photographs, and shouting out names of institutions from the logos flashed onscreen. The lucky draw was also greatly



■ NNI nurses with the Director of Nursing and Assistant Directors of Nursing from SingHealth.



■ Our Guest-of-Honour, Prof Tan Ser Kiat, with NNI Nurse Clinicians and nurses.

anticipated and created much excitement. Doctors shared in the fun as well. The celebration ended on a positive note with the nurses feeling a sense of belonging to a wonderful organisation.



Crisis Intervention Training Complement the Recommendations in Business Continuity Management Plan (BCMP)

■ Ms Tan Gek Lee, Assistant Manager (Training), Human Resource and Administration

Disasters such as SARS, fire and flood have taught us to become more valuable to situations that cannot be avoided. Some people including patients, families and staff are simply dysfunctional and require professional assistance and counselling during these crises.

As part of the BCMP initiative, 40 managers and senior executives were nominated to attend a one-day Crisis Intervention seminar. The objective is to focus on building a crisis counselling response team, which aligns with the framework of BCMP for building resilience and the capability for an effective response that safeguards the

interests of its key stakeholders, reputation and valued activities.

It is felt that the very heart of crisis intervention is to face the impact of crisis. This seminar has equipped the staff with useful tools such as crisis intervention skills, conflict and problem solving skills to address problematic issues and challenges. The knowledge learnt have assisted the BCMP team in identifying potential counsellors, realising the values of our staff and working towards a more synergetic working relationship in sustaining our organisation's critical business functions during crisis.



■ A workgroup dynamic on crisis intervention training.

ADVISOR:

A/Prof Lee Wei Ling

EDITOR:

Mrs Eunice Tay

COMMITTEE MEMBERS:

- Dr Lim Shih Hui
 - Dr Yeo Tseng Tsai
 - Dr Chng Soke Miang
 - Dr Yu Weiping
 - Junia Heng
 - Lau Puay Ngoh
 - Jaclyn Liew
 - Joanne Tan
-

ADDRESS:

National Neuroscience Institute
11 Jalan Tan Tock Seng
Singapore 308433
Tel: (65) 6357 7153
Fax: (65) 6256 4755

WEBSITE ADDRESS:

<http://www.nni.com.sg>

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