

**SYMPOSIUM 1**

**Friday, 17 April 2009, 1045–1215hrs**  
**SGH Postgraduate Medical Institute,**  
**Singapore General Hospital, Block 6, Level 1,**  
**Rooms 3 & 4**

**S01(1)**

Lights... Camera... EDUCATION! Using Patient Simulation to Train Healthcare Professionals  
*Dr Mara McAdams, Duke-NUS Graduate Medical School; Ms Anna Tan, Occupational Therapy, Singapore General Hospital*

**SYMPOSIUM 2**

**EMERGING DISEASES, DISEASE CONCEPTS AND THERAPIES**

**Friday, 17 April 2009, 1045–1215hrs**  
**SGH Postgraduate Medical Institute,**  
**Singapore General Hospital, Block 6 Level 1,**  
**Room 1**

**S02(1)**

Molecular Strategies for the Next Epidemic  
*Dr Leong Hoe Nam, Consultant, Infectious Diseases, Singapore General Hospital*

**S02(2)**

Preparedness against Emerging Infectious Diseases Outbreak: A View from the Bench Towards the Bedside  
*Dr Ooi Eng Fong, Associate Professor, Duke-NUS Graduate Medical School*

**S02(3)**

Developmental Origins of Adult Health and Disease  
*Prof Ho Lai Yun, Senior Consultant, Neonatal & Developmental Medicine, Singapore General Hospital*

**S02(4)**

Targeting the Adversary with Monoclonals — Beyond Lymphomas  
*Dr Yvonne Loh, Consultant, Haematology, Singapore General Hospital*

**SYMPOSIUM 3**

**THINKING YOUNG, WALKING GREAT AND FEELING GOOD**

**Friday, 17 April 2009, 1045–1215hrs**  
**Singapore General Hospital Lecture Theatre,**  
**Block 6 Level 9**

**S03(1)**

The Non-Motor Symptoms of Parkinson's Disease  
*Dr Prakash Kumar, Consultant, Neurology, Singapore General Hospital*

**S03(2)**

Am I Demented?: Unravelling the Clinical Features of Minimal Cognitive Impairment  
*Dr Nagendran Kandiah, Associate Consultant, Neurology, National Neuroscience Institute*

**S03(3)**

Deciphering the Causes of Poor Memory  
*Dr Dennis Seow, Consultant, Geriatric Medicine, Singapore General Hospital*

**S03(4)**

Stimulating Memory and Walking: Recent Breakthroughs  
*Dr John Thomas, Senior Consultant, Neurosurgery, Singapore General Hospital*

**SYMPOSIUM 4**

**DEBATE ON END OF LIFE ISSUES — LOVE AND LET DIE**

**Friday, 17 April 2009, 1045–1215hrs**  
**Auditorium, College of Medicine Building,**  
**Ministry of Health**

**S04(1)**

Debate on End of Life Issues — LOVE and LET Die  
*Dr Ng Bang Teen, Registrar, Anaesthesiology, Singapore General Hospital;*  
*Dr Ratnagopal Povanni, Senior Consultant, Neurology, Singapore General Hospital*

**LUNCH SYMPOSIUM  
DIABETIC RETINOPATHY SYMPOSIUM  
Friday, 17 April 2009, 1245–1330hrs  
Auditorium, College of Medicine Building,  
Ministry of Health**

**LS01(1)**

Principles in the Management of  
Diabetic Retinopathy  
*Prof Wong Tien Yin, Senior Consultant, Vitreo-Retina  
Service, Singapore National Eye Centre; Director  
Singapore Eye Research Institute*

**LS01(2)**

Novel Treatments in Diabetic Retinopathy  
*Dr Edmund Wong, Head, Clinical Quality & Senior  
Consultant, Vitreo-Retina Service, Singapore  
National Eye Centre*

**SYMPOSIUM 5  
DIABETES AND CARDIAC/  
VASCULAR DISEASE  
Saturday, 18 April 2009, 1115–1245hrs  
Singapore General Hospital, Lecture Theatre,  
Block 6, Level 9**

**S05(1)**

Preventing Cardiovascular Disease with Good  
Diabetes Control: Missing the Target?  
*Dr Daniel Wai, Consultant, Endocrinology,  
Singapore General Hospital*

**S05(2)**

PCI vs CABG: Which is the Best Option for Diabetic  
Multivessel Coronary Disease?  
*Dr Paul Chiam, Consultant, Cardiology, National  
Heart Centre, Singapore*

**S05(3)**

Periodontal Disease and Systemic Health: Is There  
a Link?  
*Dr Koh Chu Guan, Senior Consultant, Restorative  
Dentistry, National Dental Centre, Singapore*

**S05(4)**

Minimally Invasive Surgical Approach to Diabetic  
Peripheral Vascular Disease  
*Dr Mathew Sebastian, Senior Consultant, General  
Surgery, Singapore General Hospital*

**SYMPOSIUM 6  
APPLICATION OF THE STEM  
CELL TECHNOLOGY  
Saturday, 18 April 2009, 1115–1245hrs  
SGH Postgraduate Medical Institute,  
Singapore General Hospital, Block 6, Level 1,  
Rooms 3 &4**

**S06(1)**

The Potential of Resident Stem Cells for Functional  
Repair of the Brain  
*Dr Eyleen Goh, Assistant Professor, Neuroscience  
& Behavioral Disorders, Duke-NUS Graduate  
Medical School*

**S06(2)**

Embryonic and Adult Stem Cells in Drug Discovery  
*Dr Alan Colman, Executive Director, Singapore Stem  
Cell Consortium, A\*Star*

**S06(3)**

Haematopoietic Stem Cell Transplantation: Lost and  
Found in Translation  
*Dr William YK Hwang, Senior Consultant,  
Haematology, Singapore General Hospital; Assistant  
Professor, Duke-NUS Graduate Medical School;  
Medical Director, Singapore Cord Blood Bank*

**S06(4)**

Cancer Stem Cell Model of Glioma Tumorigenesis  
*Dr Carol Tang, Principal Investigator Research,  
National Neuroscience Institute*

**SYMPOSIUM 7  
ADVANCEMENTS IN MINIMALLY  
INVASIVE SURGERY  
Saturday, 18 April 2009, 1115–1245hrs  
Auditorium, College of Medicine Building,  
Ministry of Health**

**S07(1)**

Minimally Invasive Cardiothoracic Surgery  
*Dr Tan Teing Ee, Senior Consultant, Cardiothoracic  
Surgery, National Heart Centre*

**S07(2)**

Advancements in Minimally Invasive  
Colorectal Surgery  
*Dr Ng Kheng Hong, Consultant, Colorectal Surgery,  
Singapore General Hospital*

**S07(3)**

Advancements in Minimally Invasive Urology  
*Dr Tan Yeh Hong, Consultant, Urology, Singapore  
General Hospital*

**S07(4)**

Minimally Invasive Surgery; Novel Approach or  
Standard of Care?  
*Dr Shanker Pasupathy, Consultant, General Surgery,  
Singapore General Hospital*

**SYMPOSIUM 8**

**CANCER AND PALLIATIVE CARE —  
INTERDISCIPLINARY CARE IN ACTION**  
**Saturday, 18 April 2009, 1115–1245hrs**  
**SGH Postgraduate Medical Institute, Singapore  
General Hospital, Block 6 Level 1,  
Room 1**

*Dr Ong Wah Ying, Registrar, Palliative Medicine,  
National Cancer Centre;*  
*Dr Sundus Hussain-Morgan, Resident Physician,  
Palliative Medicine, National Cancer Centre*

**S01(1)**

**LIGHTS, CAMERA, .... EDUCATION! USING SIMULATION TO TRAIN HEALTHCARE PROFESSIONALS**

Mara McAdams<sup>1</sup>, Anna Tan<sup>2</sup>, Madhavi Suppiah<sup>3</sup>, Chia Yim Ling<sup>3</sup>, Peter Mack<sup>4</sup>, Chan Yew Weng<sup>5</sup>, Chew Li Ling<sup>6</sup>, Alicia Foo Si Min<sup>6</sup>, Chua Siew Mui<sup>7</sup>, Yong Cheen Mei, Catharine<sup>7</sup>, Julia Chong<sup>2</sup>, Jolene Neo<sup>2</sup>, Yetta Chan<sup>2</sup>, Jessica Tan Wan Ru<sup>2</sup>, Bhojwani Kavita Doulat<sup>8</sup>, Wong Seng Mun<sup>9</sup>, Melissa Chua<sup>9</sup>, Calvin Tan<sup>1</sup>, Sally Ong<sup>1</sup>

<sup>1</sup>Duke-NUS Graduate Medical School, Singapore; <sup>2</sup>Department of Occupational Therapy, Singapore General Hospital, Singapore; <sup>3</sup>Life Support Training Centre, Singapore General Hospital, Singapore; <sup>4</sup>Department of General Surgery, Singapore General Hospital, Singapore; <sup>5</sup>Department of Anaesthesia & Surgical Intensive Care, Singapore General Hospital Singapore; <sup>6</sup>Department of Medical Social Work, Singapore General Hospital, Singapore; <sup>7</sup>Division of Nursing, Singapore General Hospital, Singapore; <sup>8</sup>Department of Physiotherapy, Singapore General Hospital, Singapore; <sup>9</sup>Department of Speech Therapy, Singapore General Hospital, Singapore

Traditionally, education and training across healthcare fields has depended on the apprenticeship model of “see one, do one, teach one” to provide trainees with the hands-on practice necessary for their specific career. Presently, education in the fields of medicine, nursing, occupational therapy, physical therapy, speech therapy and social work blends this traditional approach with the use of simulation techniques to augment the clinical training provided.

Simulation in education spans a wide range of modalities: from task trainers used to teach a single skill like IV insertion to interviews with trained actors accurately portraying symptoms and signs to advanced, computerized manikins that can realistically undergo cardiovascular collapse and resuscitation to laparoscopic trainers that recreate the pressure changes associated with cutting through different tissues types. Simulations are an ideal way to integrate the learning of specific skills with the practice of the crucial competencies of communication and professionalism.

Training programs are increasingly using simulation methods to increase clinical training hours as access to real patients becomes more difficult. Simulation education allows for realistic training in a low-risk, low-stress environment. Simulations allow students to practice a skill repeatedly with guidance and feedback from faculty. Since it has been shown that adult students learn best through active involvement, the experiential methods employed in simulation education maximize students’ comprehension.

This symposium will illustrate the various ways in which SGH healthcare professionals use simulation in their education by showing rather than telling — a hallmark of simulation education. The session will include time to ask questions of the presenters and interact with the simulation devices.

“Tell me and I will forget, show me and I may remember, involve me and I will understand.” — Confucius

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**S02(1)**

**MOLECULAR STRATEGIES FOR THE NEXT EPIDEMIC**

Leong Hoe Nam

Department of Infectious Diseases, Singapore General Hospital, Singapore

The world is now increasingly aware of the risk of zoonosis. Fresh from the SARS experience in 2003, the world now prepares itself for the avian influenza epidemic that looms ahead of us, threatening to re-enact the death threat of the 1918 Spanish influenza pandemic. This threat is not restricted to influenza, but any infectious novel pathogen. Singapore experienced two such agents in the last decade — SARS, and Nipah viruses. The former came from China, and the latter, Malaysia. The rich biodiversities of both countries are likely to contribute yet another zoonotic infection. Key to controlling the spread of the next epidemic would be the rapid identification and characterisation of the novel pathogen and the subsequent development of a diagnostic assay.

Using molecular techniques from polymerase chain reaction, to microarrays and sequence independent PCR amplification, scientists have overcome the need for culture for the identification of a novel pathogen. The talk will explore the various molecular methodologies used in the diagnosis of these pathogens and present a staged approach in the detection of an infectious pathogen in an individual with an undefined illness. The differences and limitations of each methodology will be discussed.

**S02(2)**

**PREPAREDNESS AGAINST EMERGING INFECTIOUS DISEASES OUTBREAK: A VIEW FROM THE BENCH TOWARDS THE BEDSIDE**

Ooi Eng Eong

Infectious Diseases, Singapore General Hospital, Singapore

*Abstract not available at time of update.*

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**S02(3)**

**DEVELOPMENTAL ORIGINS OF ADULT HEALTH AND DISEASE**

Ho Lai Yun

Department of Neonatal and Developmental Medicine, Singapore General Hospital, Singapore; Department of Child Development, KK Women's and Children's Hospital, Singapore

Epidemiological data and extensive clinical and experimental studies increasingly support a relation between growth and development during foetal and infant life and adult susceptibility to certain chronic diseases. The risk of developing certain non-communicable chronic disease, such as metabolic disease, cardiovascular disease, or osteoporosis, in adulthood is influenced not only by genetic and adult lifestyle factors, but also by environmental factors acting in early life. These factors act through the processes of developmental plasticity, defined as the ability of an organism to develop in various ways, depending on the particular environment or setting. Developmental plasticity must be distinguished from developmental disruption. It requires stable modulation of gene expression, and this appears to be mediated by epigenetic processes such as DNA methylation and histone modification. Thus, both the genome and the epigenome interactively influence the mature phenotype and determine sensitivity to later environmental factors and the subsequent risk of disease. There is a mismatch between fetal expectation of its postnatal environment and actual postnatal environment. Epigenetics is an important research theme for the future. The revelation that the environment can influence gene expression and the possibility that transgenerational inheritance may occur, poses interesting questions and challenges for the future. Thus, the outcome of a pregnancy must be considered in terms of maternal and neonatal health, the growth and cognitive development of the infant, its health as an adult, and even the health of subsequent generations. Intervention strategies would even involve aspects of social structure, education, health information, nutrition, and behaviour modification, both before and after birth.

**S02(4)**

**TARGETING THE ADVERSARY WITH MONOCLONALS — BEYOND LYMPHOMAS**

Yvonne Loh

Department of Haematology, Singapore General Hospital, Singapore

Since the advent of the anti-CD20 monoclonal antibody (Rituximab) as the first B cell targeted therapy in 1997 for lymphoma, the clinical outcomes of B cell non Hodgkin lymphomas has shown dramatic improvement. The clinical efficacy, relative tolerability and safety of the drug and its mechanism of reversible B cell depletion soon led to studies in immunological diseases. The efficacy of rituximab in rheumatoid arthritis and systemic lupus erythematosus have been supported by a number of randomised studies, while its use in other autoimmune conditions has been mixed or disappointing. Other monoclonals acting on various arms of the immune system have also joined the armamentarium of the rheumatologist and neurologist, and are at various stages of clinical study. The induction of tolerance through these targeted therapies opens the promise of obviating the need for blunter tools like corticosteroids. However, such treatments may be associated with increased opportunistic infections and other complications of lympho-depletion. In targeting the adversary in autoreactive B and T cells, will we paralyse the body's defences?

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**S03(1)**

**THE NON-MOTOR SYMPTOMS OF PARKINSON'S DISEASE**

Prakash Kumar

Department of Neurology, National Neuroscience Institute (SGH Campus), Singapore

The majority of problems for Parkinson's disease (PD) patients have been thought to be motor or movement related (including tremour, slowness, stiffness and gait difficulties). However recently there is increasing evidence that a variety of non-motor symptoms (NMS) may have a greater impact on quality of life, disability, and caregiver burden than the motor symptoms of the disease. The NMS include cognitive, psychiatric, autonomic, sleep, and sensory disorders. These symptoms correlate with advancing age and disease severity, although some non-motor symptoms, such as constipation, depression, and rapid eye movement sleep behaviour disorder, can occur early even before the onset of motor symptoms. As the average age and life expectancy of the population increases, the non-motor features of PD become increasingly important.

**S03(2)****AM I DEMENTED?: UNRAVELLING THE CLINICAL FEATURES OF MINIMAL COGNITIVE IMPAIRMENT**

Nagaendran Kandiah

Department of Neurology, National Neuroscience Institute (SGH Campus), Singapore

Mild cognitive impairment (MCI) is a condition wherein a subject experiences difficulty with memory or other cognitive domains, the deficits are confirmed on objective evaluation and yet there is no impairment to function. MCI subjects do not meet criteria for dementia and continue to function independently in the community and carry out their routine daily activities. Subjects with MCI have been demonstrated to have a 10–15% annual risk of conversion to dementia. However longitudinal studies have also demonstrated that a proportion of subjects with MCI may remain unchanged and will not progress to develop dementia. When making a diagnosis of MCI, it is preferable that the cognitive complaints are corroborated by an informant. Evaluation for MCI will require adequate testing of memory, language, visuospatial function, executive function and depression. Depending on the predominant cognitive symptom, MCI can be classified into amnesic and non-amnesic subtypes. Further depending on the number of cognitive domains affected, they can be classified into single domain or multidomain MCI. Majority of subjects with MCI are in the prime of their lives and thus the onset of MCI has major implications to the individual and community at large. The use of biomarkers including magnetic resonance imaging (MRI), cerebrospinal fluid (CSF) analysis and positron emission scans (PET) increases the diagnostic accuracy for MCI and can help predict future risk of dementia. The presence of medial temporal atrophy on MRI along with an elevated tau level and reduced  $\beta$ -amyloid level in the CSF are particularly useful in predicting progression to dementia. Viewed from a management perspective, MCI provides a therapeutic window for early diagnosis and intervention of cognitive disorders. Subjects with MCI are most likely to benefit from disease-modifying therapy such as anti-amyloid immunotherapy,  $\beta$ - and  $\gamma$ -secretase inhibitors, and aggregation inhibitors. Early identification of MCI also allows clinicians to counsel and follow-up their patients more effectively.

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**S03(3)****DECIPHERING THE CAUSES OF POOR MEMORY**

Dennis Seow

Department of Geriatric Medicine, Singapore General Hospital, Singapore

Poor memory or forgetfulness is a common complaint amongst middle-aged to older persons. Causes are heterogenous, including stress, anxiety, insomnia, epilepsy, obstructive sleep apnoea, hypothyroidism, depression, delirium, dementia, etc. Early screening of cognitive and non-cognitive symptoms is warranted and important as elucidation of the underlying cause at the early stage can have significant impact on treatment, prognosis and mortality. Hence, poor memory as a complaint should not be ignored as it can be a harbinger of a more serious underlying problem.

**S03(4)**

**STIMULATING MEMORY AND WALKING: RECENT BREAKTHROUGHS**

John Thomas

Department of Neurosurgery, Singapore General Hospital, Singapore

*Abstract not available at time of update.*

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**S04(1)**

**DEBATE ON END OF LIFE ISSUES — LOVE AND LET DIE**

Ng Bang Teen<sup>1</sup>, Ratnagopal Pavanni<sup>2</sup>

<sup>1</sup>Department of Anaesthesiology, Singapore General Hospital, Singapore; <sup>2</sup>Department of Neurology, Singapore General Hospital, Singapore

*Abstract not available at time of update*

**LS02(1)**

**PRINCIPLES IN THE MANAGEMENT OF DIABETIC RETINOPATHY**

Wong Tien Yin

Vitreo-Retina Service, Singapore National Eye Centre; Singapore Eye Research Institute, Singapore

Diabetic retinopathy is the leading cause of blindness among working adult persons aged 20–65 years. Epidemiologic and clinical trial data show that early detection of retinopathy, intensive glycaemic and hypertensive control and timely laser photocoagulation treatment for sight threatening retinopathy (proliferative retinopathy and clinically significant diabetic macular oedema) could prevent retinopathy progression and visual loss, would be “cost-effective,” and would improve quality of life and reduce lost productivity due to blindness. New large multi-centre clinical trials data (FIELD, DIRECT, ADVANCE) suggest an increasing importance and role for systemic management of lipids and blood pressure in management of patients with diabetes to prevent retinopathy.

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**LS02(2)**

**NOVEL TREATMENTS IN DIABETIC RETINOPATHY**

Edmund Wong

Clinical Quality, Singapore National Eye Centre, Singapore; Vitreo-Retina Service, Singapore National Eye Centre, Singapore

*Abstract not available at time of update.*

**S05(1)**

**PREVENTING CARDIOVASCULAR DISEASE WITH GOOD DIABETES CONTROL: MISSING THE TARGET?**

Daniel Chun-Hang Wai

Department of Endocrinology, Singapore General Hospital, Singapore

Major studies like the United Kingdom Prospective Diabetes Study (UKPDS) and Action in Diabetes and Vascular Disease: Preterax and Diamicon Modified Release Controlled Evaluation (ADVANCE) had demonstrated the effectiveness of preventing microvascular complications, namely nephropathy, retinopathy and peripheral neuropathy in diabetes mellitus. The UKPDS also led to the recommendation of 7% as a target for glycated haemoglobin-a1c (HbA1c) all over the world. However, the original UKPDS did not show significant reduction in macrovascular complications of cardiovascular diseases. Then last year the Action to Control Cardiovascular Risk in Diabetes (ACCORD) study, comparing intensive glycaemic target of HbA1c<6% with the moderate control target of 7– 8%, was terminated early. It shocked everyone because the intensive group suffered higher mortality. The results were fortunately not replicated in the ADVANCE or the Veterans Affairs Diabetes

Trial (VADT), both of which tested similar intensive control versus conventional therapy. It emerged however in both ACCORD and VADT that major hypoglycaemia in any group increases mortality. On the other hand, blood pressure control with antihypertensives especially agents that act on the renin-angiotensin-aldosterone axis, lipid control with lipid medication, use of aspirin, and smoking cessation had all been much more effective in the reduction of macrovascular risk. Given all these modern beneficial treatment, the actual risk observed had become much lower than was originally expected, suggesting that the effect of lowering glucose on prevention of macrovascular complications is modest and is furthermore offset by the detrimental effect of hypoglycaemia. Thus studies that focus on glycaemic control solely may not show any macrovascular benefits. On the other hand, Steno-2, using a global risk reduction strategy, managed to show 53% reduction in macrovascular complications while also significantly reduced microvascular complications in high risk patients. It is therefore clear that a global risk reduction strategy for patients with diabetes mellitus is vital.

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**S05(2)**

**PCI VS CABG: WHICH IS THE BEST OPTION FOR DIABETIC MULTIVESSEL CORONARY DISEASE**

Paul Chiam

Department of Cardiology, National Heart Centre, Singapore

*Abstract not available at time of update.*

**S05(3)**

**PERIODONTAL DISEASE AND SYSTEMIC HEALTH: IS THERE A LINK?**

Koh Chu Guan

Periodontics Unit, Department of Restorative Dentistry, National Dental Centre of Singapore

In recent years, there has been an increasing interest in how periodontal disease might affect the general health of the individual. Associations between periodontal disease and cardiovascular disease, obesity, diabetes, pre-term-low birth weight babies and other conditions have been shown. Some of these associations have been well established, while others are still lacking strong evidence of a cause-effect link.

This presentation will describe the pathology of periodontal disease, and attempt to present the data available concerning some of these associations.

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**S05(4)**

**MINIMALLY INVASIVE SURGICAL APPROACH TO DIABETIC PERIPHERAL VASCULAR DISEASE**

Mathew Sebastian

Department of General Surgery, Singapore General Hospital, Singapore

*Abstract not available at time of update.*

**S06(1)**

**THE POTENTIAL OF RESIDENT STEM CELLS FOR FUNCTIONAL REPAIR OF THE BRAIN**

Eyleen Goh

Department of Neuroscience and Behavioral Disorders, Duke-NUS Graduate Medical School, Singapore

Adult neurogenesis occurs throughout life in discrete regions of the adult mammalian brain. New neurons exist in the adult brains of many different species, and are continuously generated and integrated into the existing circuitry. But little is known about the molecular mechanisms regulating the development and integration of adult-born neurons including differentiation, growth, migration, path-finding and synapse formation. We used mouse genetics in combination with short-hairpin RNA technology and retroviral technique to study the molecular mechanisms of these newborn neurons. An understanding of the developmental processes of these newly generated neurons is not only important for deciphering the mystery in the adult brain, but also paving the way for cell replacement therapy. Stem cells transplanted into the adult brain can then be effectively accustomed for different brain disorders. Neuroregeneration of the adult brain with exogenous or resident progenitor cells will also be discussed.

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**S06(2)**

**EMBRYONIC AND ADULT STEM CELLS IN DRUG DISCOVERY**

Alan Colman

Singapore Stem Cell Consortium, A\*Star

*Abstract not available at time of update.*

**S06(3)****HAEMATOPOIETIC STEM CELL TRANSPLANTATION: LOST AND FOUND IN TRANSLATION**

William YK Hwang

Department of Haematology, Singapore General Hospital, Singapore; Duke-NUS Graduate Medical School, Singapore; Cord Blood Bank, Singapore

Haematopoietic stem cell transplantation (HSCT) started out as a disaster. The post atomic age and the ability to completely ablate a human being's blood forming cells spawned an entire generation of researchers in the quest for one answer: could we successfully and permanently replace the haematopoietic cells of an individual whose bone marrow cells have inadvertently failed (through nuclear accidents or disease) or which have been destroyed in an attempt to cure a haematological malignancy? Despite numerous successful experiments in animals, allogeneic human bone marrow transplants were met with failure 99% of the time and the clinical research in this field was declared dead.

However, in 1968, the involvement of clinicians and scientists actively involved in bedside and bench research led to the first clearly successful human HSCTs being carried out. The revival of clinical practice and research in HSCT came through the development of better immunosuppressive regimens, improvement in histocompatibility testing, and enhanced chemo/radiotherapy protocols. Over the last four decades, nearly a hundred thousand successful HSCTs have been performed. Close pairing of scientific study and clinical research led to progress beyond its original boundaries. The use of peripheral blood stem cell transplants have enabled faster recoveries of blood counts and increased willingness to donate stem cells. Genomic technologies have allowed selection of high-risk patients so that they could be transplanted in a better clinical state prior to relapse from chemotherapy. The use of sub-lethal or nonmyeloablative doses of chemo/radiotherapy prior to the transplant followed by infusions of donor cells have allowed disease control through cellular immunotherapy even in elderly, high-risk patients. While the fully matched related or unrelated bone marrow donor is difficult to find, the use of haploidentical transplants and cord blood HSCT allows for the ability to perform partially mismatched transplants and the potential that, in future, every patient in need of a HSCT could find a suitable donor.

While HSCT could be partially supplanted by future treatments for certain diseases, it is likely to remain relevant as it is refined by safer transplant protocols and research into the delivery of cells manipulated to perform specific targeted functions. Meanwhile, its track record of failures and successes form a road map for researchers of other stem cell therapies seeking to translate their findings to the clinic.

**S06(4)****CANCER STEM CELLS: LEARNING FROM BRAIN TUMOURS**

Carol Tang

Department of Research, National Neuroscience Institute (SGH Campus), Singapore

Although malignant tumours are known to be composed of a variety of different cell types, this concept of cellular heterogeneity in the study and design of anti-cancer therapeutics has largely been ignored. Emerging evidence in recent years has established key culprit cells within the tumour mass — the “cancer stem cells”, which are responsible for initiation and propagation of tumour growth. These cancer stem cells are notoriously resistant to radiation and chemotherapy. The latter adjuvant therapies, which preferentially target rapidly dividing cells thus end up eliminating the bulk of tumour cells but spare these stem cells which divide at a much slower rate.

Primary malignant brain tumours are devastating cancers with poor survival rates despite major advances in surgical technology and adjuvant therapies. Our work demonstrates the isolation of brain tumour stem cells from patient tumour samples, which are capable of re-creating tumour masses in mice. These implanted cells in the mouse brain eventually form tumours with morphology identical to that seen on pathological analysis of patient specimens. These tumour cells-of-origin display genetic profiles totally distinct from the tumour bulk. Importantly, we have found that different patients with similar tumour tissue pathology on microscopic examination display very different genetic profiles in their cells-of-origin, the cancer stem cells. This has major implications as current treatment strategies are largely decided based upon classification systems tailored according to morphological characteristics of the tumour. The different genetic profiles of such tumour stem cells might explain variability of treatment response and points to the existence of different genetic brain tumour subtypes which one is unable to discern based on current classification systems.

This talk will explain some of the fundamental concepts of cancer stem cell biology, and highlight key findings from our recent work published in *Stem Cells* (Jan, 2009).

**S07(1)**

**MINIMALLY INVASIVE CARDIOTHORACIC SURGERY**

Tan Teing Ee

Department of Cardiothoracic Surgery, National Heart Centre, Singapore

*Abstract not available at time of update.*

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**S07(2)**

**ADVANCEMENTS IN MINIMALLY INVASIVE COLORECTAL SURGERY**

Ng Kheng Hong

Department of Colorectal Surgery, Singapore General Hospital, Singapore

Since the first laparoscopic colorectal resection was performed in 1992, minimally invasive approaches to various colorectal conditions have gained wide acceptance. Over these years, the indications have expanded to malignant conditions as mid-term results of various randomised controlled trials have shown that the laparoscopic approach to be equivalent, if not superior, to the conventional open method in colon cancer resection. The use of laparoscopic approach for low anterior resection has also been shown in various large reported series to be safe and effective for rectal cancer.

The use of hand-port has developed in parallel to the conventional laparoscopic approach over the past decade. However, its use is largely confined to more complex cases in which conventional laparoscopic approach is too time-consuming and locally advanced cancer. Recent developments in the minimally invasive approach have been moving toward less or smaller incisions. There are various recent reports on the use of "single-port" laparoscopic approach and is fast gaining popularity. Transrectal retrieval of resected specimen (NOSE, Natural Orifice Removal of Specimen) has been described by various centres in an attempt to avoid the abdominal incision.

Robotic assisted colorectal surgery was first reported in 2002 and since then it is used routinely in more than 10 centres in the world. The use of robotics has the advantages of 3-dimensional visualisation, 7-degree of movement for the dissecting and retracting arms, movement scaling to allow fine dissection in confined space, etc. It is especially useful for dissection in the deep narrow pelvis for low rectal cancer. Perseveration of pelvic nerves is greatly enhanced by robotic approach, which in turn translated into better post-operative sexual, urinary and anorectal functions for the patients. With continual advancement in robotic technology, more compact and versatile surgical robots will be developed.

**S07(3)****ADVANCEMENTS IN MINIMALLY INVASIVE UROLOGY**

Tan Yeh Hong

Department of Urology, Singapore General Hospital, Singapore

During the last three decades, there has been tremendous development in the specialty of Urology. Advances have been made in the area of techniques and technology. The evolution from maximally invasive to minimally invasive to non-invasive surgery has been best demonstrated in our field of Urology. The lecture gives an update on laparoscopy, endoscopy, robotic assisted surgery, needle ablative surgery and non-invasive therapy in the current management of benign and malignant urological diseases.

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**S07(4)****MINIMALLY INVASIVE SURGERY: NOVEL APPROACH OR STANDARD OF CARE?**

S Pasupathy, B Tan, R Sivanandan, WH Chan, YM Tan, SG Tan

Department of General Surgery, Singapore General Hospital, Singapore; National Cancer Centre, Singapore

The field of surgery has undergone a veritable revolution in the past 2 decades. The old adage of “big surgeon, big incision” has ceased to apply, with an array of minimally invasive techniques available to perform even the most complex procedures today.

This has been made possible owing to breakthroughs in two important arenas: medical imaging and surgical tools. Detailed, high-resolution images allow surgeons to plan every procedure carefully, avoiding the need to “look and proceed” in the majority of complex interventions. Procedures can also be staged, by performing preliminary diagnostic assessments and biopsies in the radiology or endoscopy suite first, to determine whether or not surgery is necessary at all. When patients finally proceed to surgery, this too, can be focussed on the job at hand, using cameras and miniaturised instruments which can be placed through incisions only a few millimetres wide.

Benefits of minimally invasive surgery include decreased surgical stress and faster return to a normal physiological state. Patients frequently have less wound pain and discharge earlier from hospital. As with any interventional procedure, success is closely related to the skill, training and experience of the practitioner. Therefore continued training and re-training is necessary to consistently ensure the best outcome.

Across the Department of General Surgery, more and more procedures are being performed in a less and less invasive fashion. This lecture will provide an overview of the treatment of arterial, venous, breast, thyroid, stomach, liver and pancreatic conditions using minimally invasive interventions. Data will be presented to show how surgery is evolving in the 21st Century.

**S08(1)**

**CANCER AND PALLIATIVE CARE — INTERDISCIPLINARY CARE IN ACTION**

Ong Wah Ying, Sundus Hussain-Morgan

Department of Palliative, National Cancer Centre, Singapore;

This symposium aims to highlight the role of palliative care in cancer management. By bringing together a panel of expert speakers to discuss two case studies, it hopes to demonstrate the multi- and interdisciplinary nature of palliative care at work. There will also be time for the audience to pose questions to the panel.