LEE KONG CHIAN SCHOOL OF MEDICINE

The LKCMedicine Redefining Medicine, Transforming Healthcare

NANYANG TECHNOLOGICAL UNIVERSITY

LKC Medicine's bi-monthly newsletter

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Imperial College London

The Lee Kong Chian School of Medicine, a partnership between NTU and Imperial College London, will train a generation of doctors who will put patients at the centre of their exemplary medical care. Graduates of the five-year undergraduate medical degree programme beginning in 2013 will have a strong understanding of the scientific basis of medicine, along with interdisciplinary subjects including business management and technology.

The school's primary clinical partner is the National Healthcare Group, a leader in public healthcare recognised for the quality of its medical expertise, facilities and teaching. The school, named after local philanthropist Dato Sri Lee Kong Chian, aims to be a future model for innovative medical education. Its first doctors will graduate in 2018 with a Bachelor of Medicine and Bachelor of Surgery (MBBS), awarded jointly by NTU and Imperial College London, and become doctors who will enhance Singapore's healthcare in the decades to come.

EDITOR'S CORNER

For this second edition of the LKCMedicine newsletter, we've gone paperless in the spirit of going green, and as part of NTU's bigger focus on nurturing a Sustainable Earth. At another level, the School shares this ambition by aiming to build a sustainable future campus at NTU's Yunnan Garden site and in Novena. If one were to drop by 11 Mandalay Road, the speed at which the School's new headquarters is being readied may surprise. This, while the LKCMedicine space in NTU's Research Techno Plaza is undergoing expansion.

Alongside this ramped-up construction of its facilities, the rest of the School is shaping up nicely, thanks to the expertise provided by its parent universities. These past two months, our admissions processes are being fine-tuned, research labs are being kitted out, renowned scientists invited over to jump start strategic research programmes at the School and our curriculum teams are working feverishly to firm up teaching material and our collaborative learning matrix. Meanwhile, our Assistant Deans are looking into how we can take simulation in medical education to new levels and stress the importance of integrated care in the LKCMedicine programme. All these are featured in this edition of the newsletter. I hope you enjoy the read.

Siti Rohanah Koid

Message from our Staff

Professor Martyn Partridge Senior Vice Dean, LKCMedicine



A truly successful medical school requires three important components. Quality medical education is vital if we are to produce professional and competent doctors equipped for today's healthcare challenges, and who acknowledge patients' growing expectations and desire for shared decision making. High quality medical education needs to be equally respected alongside high quality scientific research, and top rate academics understand their role in inspiring and developing future colleagues. However, neither good teaching nor good translational research can be undertaken unless the third component is in place, namely extremely good relationships with our major clinical partners.

These three components are receiving equal attention from the whole team at LKCMedicine, for all are interlinked. The learning outcomes and content for Years 1 and 2 of the school's new programme are now almost complete and they will be used within a course heavily dependent upon collaborative learning. Experts in Team Based Learning have visited and others are being appointed and a faculty development programme undertaken, but our ethos is for our scientists and clinicians to partake of these learning sessions as experts in their field and not to have to be concerned by the logistics of the learning method.

In parallel with the effort that is going into collaborative learning is an equal effort to ascertain how we can take simulation in medical education to new levels. We believe that this process involves far more than a communications course involving actors. At LKCMedicine this will involve use of simulation, including hybrid simulation, throughout all five years of the course looking at the whole aspect of doctoring, from communication to practical competency to appreciation of different ways of delivering healthcare. Our students have to clearly understand the importance of integrated care, namely care delivered by the most appropriate healthcare professional at the most appropriate time in the optimal setting.

Inevitably with such a large venture as starting a new medical school we will be pushing the envelope, but the innovation which we are instituting has always been tested somewhere else, and very often at Imperial. Over the next nine months we have in place a robust system for testing all parts of our new curriculum and its delivery. We are confident that Singapore will have a new medical school producing doctors for Singapore of the type that you and I would wish to have caring for us.

IN BRIEF

Postdoctoral Fellowship launch

The LKCMedicine Postdoctoral Fellowship will be launched this year, to nurture a cadre of talented biomedical and clinical research scientists. One Fellowship will be awarded a year. The School has identified five research themes it expects to achieve excellence in: neuroscience and mental health, metabolic disease, infectious disease, bioengineering including structural biology, and health services outcome research.

LKCMedicine in Shanghai

An LKCMedicine team was in Shanghai end August to present at the Singapore Consulate-General Open House 2012, upon the invitation of Contact Singapore. The team also met with Singaporean students at the Shanghai Singapore International School, Yew Chung International School and Suzhou Singapore International School. The team also visited Fudan University, at the invitation of its School of Pharmacy Dean.

Partnering Institute for Media Innovation

LKCMedicine is partnering NTU's Institute for Media Innovation to produce software for the iPad that will provide 3-D models of the human body. The project will see the recruitment of local patients and the plan is to create a central database of 3-D models of real-life patients. The project for a start will focus on reproducing 3-D models of the lower limbs.

SMARTMesh for hernia repair

A new technology invented by NTU Provost Professor Freddy Boey has been used by Singaporean start-up Medlinx Acacia to create SMARTMesh, a hernia mesh made of a polymer-based material that promises to help patients heal better and faster with fewer side effects, while being easier on the pocket. Medlinx Acacia said the product was made possible by working with NTU's School of Materials Science and Engineering.

Vibrant univer-city takes shape at NTU



LKCMedicine students can look forward to a transformed NTU campus, when a new univer-city with varied spaces for education, research, social and leisure activities takes shape in the next few years. .

Under Phase 1 of the University's Campus Master Plan unveiled at a groundbeaking ceremony by Minister for Education Heng Swee Keat on October 12th, two learning hubs, eight residential halls, a new graduate hall, and two academic buildings will be added to the campus. These are expected to be completed by 2016 and will cost S\$700 million.

NTU President Professor Bertil Andersson said, "Our ambition is to build a modern campus that is at the leading edge of science and technology. Hardware and facilities are vital to generate and testbed innovative ideas, as well as to spur collaboration among our faculty, students, industry and global partners. Once our new state-of-the-art buildings and facilities are up and running, they will deepen and widen the research and development capacity in NTU, and further promote collaboration both within and across disciplines."

Among the exciting developments is the building of the first Learning Hub, a seven-storey centre housing 55 newgeneration classrooms of the future, designed to support new pedagogies by promoting more interactive small group teaching and active learning. It is envisaged as a 24-hour centre equipped with a cafeteria, library and even a roof top garden.

On-campus living will be boosted with the building of additional halls of residence for students - 1,250 more spaces by July 2014, and 5,000 more by 2015. This will allow every undergraduate who desires to stay on campus to be able to do so. In addition, a new graduate hall will be ready by December this year, more than doubling the current 480 places to 1,170 places.

Also in the pipeline is a new Academic Building near NTU's School of Material Science and Engineering, and the School of Mechanical and Aerospace Engineering. About 2.5 times the size of a football field, the building will enhance both schools' laboratory facilities and provide more room for multidisciplinary collaboration by teams of students, faculty, visiting professors and researchers..

This new building will complement LKCMedicine's upcoming Experimental Medicine Building. To be completed in 2015, this building will be located within NTU's biomedical engineering cluster and linked to the School of Biological Sciences.



Generous Scholarships and Bursaries for LKCMedicine Students

Without doubt, medical schools attract applications from the best and the brightest. At LKCMedicine, we maintain a strict merit-based admissions policy and are committed to ensuring that all students who are admitted will not be denied an education at the School due to financial hardship. Thanks to our donors and NTU, generous scholarships and bursaries will be available for our students.

In this edition, we are pleased to announce that outstanding students aiming to pursue their undergraduate MBBS programme at LKCMedicine may apply for the Nanyang Scholarship as well as the LKCMedicine Scholarship, each tenable for five years. The most prestigious undergraduate scholarship at NTU, the Nanyang Scholarship will fund annual tuition fees in full, annual living, accommodation and book allowances, and one-off computer and travel grants. In addition, the Nanyang Scholar will enjoy priority for NTU's Global Immersion Programme.

The all-new LKCMedicine Scholarship will fund annual tuition fees in full as well as annual living and book allowances, and a one-off computer grant.

For students experiencing financial

hardship, LKCMedicine offers a generous number of bursaries, thanks to the kind donations of Lee Foundation and the E I Parrish Trust.

The Lee Kong Chian Bursary and the E I Parrish Bursary – established by the Lee Foundation and the E I Parrish Trust respectively – will fund up to 80 per cent of annual tuition fees and an annual living allowance. In exceptional cases, the E I Parrish Trust will fund 100 per cent of annual tuition fees and an annual living allowance.

For more information, please visit our website: www.lkcmedicine.ntu.edu.sg

TAKING MEDICAL SIMULATION TO NEW LEVELS By Dr Tanya Tierney





Imagine you are in an A380 on Singapore Airlines, about to take off. You are putting your life in the hands of the pilot trusting that he or she has been trained to deal with any emergency that

might arise. That pilot will have been trained using simulation - everything from the basic routine take-off to emergency landings in severe weather conditions or engine failure. This ensures that the pilots are prepared for the real thing at every stage of their training.

How does this apply to LKCMedicine?

At LKCMedicine, we are also using this approach to simulation – we will ensure our students feel prepared at every stage of their medical training by carefully planned simulation that is

aligned with the rest of the curriculum. Simulation is not a replacement for real clinical exposure, but an adjunct which will help them feel confident and be competent before they work with real patients in a real clinical setting.

How do we align simulation with the curriculum?

It is natural for new medical students to feel nervous about talking with patients. In our introductory course, students will spend one week in a polyclinic and one week in a hospital setting. Prior to this they will work with simulated patients (SPs - role-players hired to play the part of a patient in a realistic way) to practise simply approaching the patient and asking if they can talk to them for 5 minutes about why they have come to the polyclinic or hospital today. They can practise

We keep them one step ahead of what they will be expected to do with real patients.

essential basic skills like introducing themselves, active listening as the patient tells their story and dealing with situations that might arise - for example a patient who might be worried about missing their appointment or one that doesn't want to speak with a student. SPs will give feedback to the students to help them develop their communication skills.

As the students progress through their course, their interactions with SPs become more challenging. We lead the students through more and more complex skills - history taking, explaining diagnoses to patients, explaining risks of procedures, breaking bad news, dealing with patients who are upset, or angry, dealing with ethical dilemmas and more. We keep them one step ahead of what they will be expected to do with real patients.





LKCMedicine is recruiting Simulated Patients such as these.

Simulation is not a replacement for real clinical exposure, but an adjunct which will help them feel confident and be competent before they work with real patients in a real clinical setting.

Where do we get the Simulated Patients from?

SPs are recruited from the general public but usually will have a background in acting as they need to be realistic in their portrayal of the patient. We provide training for them in role-play and also in how to give feedback to students to support their learning. We have started recruiting SPs and will be building up our pool of SPs and running training for them over the next few months.

What other sorts of simulation are we using?

The practical skills will be taught with "part task trainers" or models of body parts specially designed for students to practise on. For example, students can practise suturing on a pad made of skinlike material or can practise venepuncture on an arm designed for just that. Once students have learned the technique they can practise in "hybrid simulation" where we align the part task trainer with an SP – this means that the students need to consider how they interact with the patient whilst performing the technical skills.

What about more complex simulations?

The possibilities are limitless. For example, last June, in collaboration with a team lead by Professor Roger Kneebone, Imperial College's Professor of Surgical Education and LKCMedicine's Visiting Professor, we have delivered complex surgical simulation involving a full surgical team, student paramedics and audience participation in a theatre setting for an audience of 600. These kinds of complex simulations can be designed to incorporate complex techniques, team interactions and potential challenges always keeping in mind what is required of the students at that stage so we keep our simulations aligned with the rest of their curriculum. As students progress through the curriculum, we will design more complex scenarios for them to take part in.

What about mannequin simulation?

For some scenarios, the best "patient" is a whole body mannequin. Full body



mannequins are highly sophisticated models that can be controlled wirelessly. They breathe, bleed, blink, even shiver and sweat. They have realistic breathing and circulatory functions and can simulate many cardiorespiratory problems including cardiac arrest and difficult airways and are used for resuscitation training.

Where will all this take place?

In the upcoming Clinical Sciences Building at our campus in Novena, we will have state-of-the-art Clinical and Communication Skills Centre (CCS). Here, students will practise consultations with SPs in realistic consulting rooms and keep digital recordings of their consultations in the e-portfolio. They will learn practical skills in the clinical skills lab and then move on to hybrid simulation in the simulated ward setting. Students will also be trained at the brand new simulation centre (SIMTAC) at Tan Tock Seng Hospital, which will be extremely useful while the Clinical Sciences Building is being constructed. The building will be ready by 2015.

In Conclusion

Our simulation programme aims to provide students a safe environment in which to practice new skills and techniques. Aligning simulation alongside the curriculum will ensure that students are fully prepared to get the best out of their clinical placements, making the best use of the time given by their clinical teachers and real patients they see on attachments. Like the passengers on the A380, patients meeting LKCMedicine students can feel safe in the knowledge that the student is fully prepared to carry out the task they are now being asked to consent to, whether it be a simple history taking, or something more practical like taking blood or suturing a laceration.

Benefits of Simulation

- Provide a safe setting for students to practise their skills
- Reduce the burden on clinical teachers and the patients in their care
- Ensure all students are exposed to essential scenarios
- Allow students to experience rare cases that they may not see otherwise
- Allow students to receive feedback from SPs, peers and tutors
 - Allow students to keep recordings of their SP encounters
 - Allows standardisation of assessments (e.g. Simulation in OSCE exams)

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LKCMedicine has appointed an eminent group of Visiting Professors to jump start strategic research programmes at the school and the university in areas of metabolism, radiochemistry and simulation technologies. The School welcomes Professor Walter Wahli, Professor Christer Halldin, Professor Balazs Gulyas, Professor Roger Kneebone and Dr Fernando Bello.

Professor Wahli is Professor of Biology and Founding Director of the Centre of Integrative Genomics, University of Lausanne. He is one of the pioneers who discovered the medically relevant Peroxisome Proliferator-Activated Receptors and has demonstrated the central physiological significance of these regulatory proteins in metabolism, inflammation and wound healing. Professor Wahli will develop a strategic programme focusing on research questions that will constitute part of a broader Singaporean initiative that concentrates on late pregnancy and early postnatal life, with aims to identify molecular mechanisms and molecules, emanating from the interplay between nutrients and microbiota in relation to obesity and associated metabolic diseases

Professor Halldin is Professor of Medicinal Radiochemistry and Director

Team-based Learning at LKCMedicine

By Dr Preman Rajalingam

Medicine has progressed greatly during the last three decades and by some estimates, the amount of medical knowledge that a doctor has to deal with doubles every five to seven years. However faculty-student contact hours cannot be expanded in parallel, unless the time taken to complete a medical degree also becomes longer and longer. Textbooks, video recorded lectures, electronic resources, and web-based units of study make possible independent learning outside class, but how does one ensure that future doctors have really understood and can apply what they have learnt?

To address this challenge, LKCMedicine has decided to engage students in a form of active learning called Team-Based Learning (TBL). TBL incorporates multiple small groups of 5–7 students within a single classroom and has been

Top Names Appointed for Research

By Dr Andrew Ang and Dr Ng Sean Pin

of the Positron Emission Tomography (PET) Centre, Karolinska Institutet. He is a scientific leader with an established reputation in running the internationally competitive translational neuroimaging PET centre at Karolinska that spans from small animals to humans, focusing primarily the development of new tracers for neuroimaging. Today, more than 1/3 of the radioligands used for clinical brain PET imaging throughout the world had been developed by this group. Professor Gulyas is Professor of Neuroscience at Karolinska Institutet and an expert in PET neuroimaging. Together with Professor Gulyas, Professor Halldin will develop a strategic programme in translational neuroimaging and explore collaboration with the National Neuroscience Institute, Institute of Mental Health and the Clinical Imaging Research Centre, NUS.

Professor Kneebone is the Professor of Surgical Education, Imperial College London. He is a world renowned expert



in the use of simulation in medical education and has pioneered the concept of hybrid simulation, aligning inanimate simulators with real people to create realistic yet safe clinical encounters. Professor Kneebone will conduct research in simulation technologies for surgical training and healthcare in collaboration with LKCMedicine and the NTU Engineering Schools.

Dr Bello is a Reader in Surgical Graphics and Computing, Department of Surgery and Cancer at Imperial. His main research work is in modelling and simulation, medical virtual environments and haptic interaction with application areas spanning across education and technology development. Dr Bello will conduct research in medical visualisation and augmented reality in collaboration with LKCMedicine and the NTU Engineering Schools.

Professor Roger Kneebone





used effectively with both large (>100 students) and smaller classes (<25 students). At LKCMedicine students will be able to access the material on their iPads ahead of time for self-study instead of attending a lecture in class. When they are in class, they will first work individually and then as a team to answer questions posed by expert faculty and will receive immediate feedback on how well they have understood the material. Having spent time learning the

material beforehand, students will be able to have much more meaningful discussions with both their classmates and faculty in class. In fact most of the in-class time will be spent solving authentic problems that reinforce the material. Hence an LKCMedicine student will leave class at the end of the day both knowing the key concepts and thinking about these concepts like a doctor.





Marrying Science and Medicine

By Professor Michael A. Ferenczi

How much Science should doctors know? This question is pertinent to those setting out the curriculum for our students in the LKCMedicine at NTU. Some might argue that in dayto-day life, doctors need little science background as what makes a good doctor are her/his communications skills, bedside manner, clinical skills and experience.

So where is the Science? I would argue that understanding of the body's processes in health and disease, down to the functioning of molecules such as DNA and proteins is key for the formation of our Doctors. The human body is a complicated place, with interactions between all systems at all levels, from molecules to the brain, not forgetting the role of the environment through diet, exercise, stress and affective interactions. It is perhaps the French physiologist Claude Bernard who first realised in the 19th century how interconnected the organs of our bodies are, and how the cells and tissues communicate and interact to maintain a steady internal environment, the milieu intérieur' of the living organism, a process which he called 'homeostasis'. Much of medical science since has been concerned with temperature kept constant whatever the weather? How is our blood pH remaining within narrow limits however blood sugar kept constant, whether we fast or feast? Understanding these processes allows us to recognise disease. Greater understanding allows us to use drugs wisely or to discover the cause of disease.

Future improvements in our health will be based, as it has been in the past, on new information, new measurements, technical breakthroughs and greater understanding. Our doctors of tomorrow will not know everything there is to know, but will have a solid grounding in biomedical sciences and, perhaps more importantly, will know where to find the relevant information, how to understand and apply new information by interacting within their teams and beyond, and will know how to stay at the forefront of their profession throughout their career. In LKCMedicine, I shall strive to make sure that our students will be equipped with the basic knowledge, and the tools, that they will need to grow into the very best of doctors, whether in primary care, in sophisticated hospitals or making groundbreaking advances in experimental medical science

What about Research?

the organs of our bodies are, and how the cells and tissues communicate and interact to maintain a steady internal environment, the milieu intérieur' of the living organism, a process which he called 'homeostasis'. Much of medical science since has been concerned with understanding homeostasis. How is our temperature kept constant whatever the weather? How is our blood pH remaining within narrow limits however much orange juice we drink? How is our bombarded with daily news stories about new treatment for this or new cure for that, is she or he not entitled to get from his doctor the most up-to-date and most effective treatment? How can the doctor understand new developments and improvements in medical care without being familiar with medical research, with its mind-boggling new technologies, the ever-expanding jargon of molecules, genes, mutations, drugs and signals?

The answer to these questions is found in Medical Education built on a strong grounding in the Scientific Method, in Evidence-based Medicine and in training in Research Methodologies. This is why LKCMedicine is building state-of-the-art research facilities and a strong core of Basic Sciences and Clinical Sciences. New buildings are being erected to house Experimental Medicine and Clinical Sciences - to ensure that our doctors' teachers will be involved in the scientific developments of the future, and will search and innovate. Their students, our future doctors, will be inspired by the research, and will contribute and participate in its progress. These future doctors will understand the limitations of their knowledge, and then will go beyond it, by continuing to learn, and to discover.





Medical Students Assist in Shaping LKCMedicine Curriculum By Dr Naomi Low-Beer

With the English summer well and truly over, we have said goodbye to our medical students who gave up much of their holiday to work on the curriculum - drafting MCQs for team-based learning (TBL) and undertaking a comprehensive review of the LKCMedicine curriculum. Our special thanks to Claire Vassie (year 4) and Brendan Thoms (year 3), key members of our Curriculum Review Team. They did a superb job analysing materials, checking for consistency and sequencing, and for alignment with learning outcomes. This has provided extremely useful student feedback for course leads in London. Colleagues in Singapore have given tremendous support – their feedback has been invaluable and some have developed new learning content. We are particularly grateful to Heng Bee Hoon (Public Health & Epidemiology) and Chu Sze Hon (Dermatology) for their work, which has been of the highest quality.

Our focus is now on the educational materials to support TBL. Recordings of

narrated PowerPoints are underway and videoed lectures and eModules will follow, all accessible by iPad. Collaborative working is more important and productive than ever – our videoconference facility is increasingly used to discuss a range of curriculum issues, including timetabling, exams, TBL applications and ePortfolio. Many thanks to all those involved for their hard work and commitment – excellent progress is being made.



United in Philanthropy

By Suzanne Lim

In 1844, philanthropist Tan Tock Seng's (1798 – 1850) gift made it possible to build the Chinese Paupers' Hospital at Pearl's Hill, Singapore's first privately funded hospital. Renamed Tan Tock Seng Hospital (TTSH) after Tan's death, it moved to its current location in Novena in 1903.

TTSH has since grown from strength to strength and is consistently voted Top Teaching Hospital by medical students. As LKCMedicine's primary clinical partner, TTSH will provide vital training support for our students. In addition, LKCMedicine's administrative headquarters will be housed in TTSH's former nurses' hostel at block 107, Mandalay which has been gazetted as a heritage building.

Tan Sri Dato Lee Kong Chian (1893 – 1967) is synonymous with philanthropy in Singapore, having founded the Lee Foundation in 1952. The Foundation has continued with its founder's legacy of giving to education, most notably with its landmark \$150 million gift to LKCMedicine in 2011.

Singaporeans are also forever indebted as it was the Lee Foundation's gift of \$375,000 to build the National Library at Stamford Road in 1960 that spearheaded free public library services for the nation.

With LKCMedicine joining TTSH in Novena come August 2013, two of Singapore's most illustrious names in philanthropy are now united to herald in a new era for medical education and healthcare in Singapore.

To explore giving to LKCMedicine, please contact Suzanne Lim at suzanne. lim@ntu.edu.sg or +65 6592 1784.

FROM THE LONDON OFFICE



Visit by LKCMedicine

By Paul Ratcliffe

On October 1st, Imperial College London's Faculty of Medicine (FoM) welcomed its new Principal, Professor Dermot Kelleher who concurrently holds the position of Dean of the Lee Kong Chian School of Medicine, a joint medical school by Imperial and NTU.

In his first message to the FoM, Professor Kelleher wrote about the warm welcome he had received, adding that it is a pleasure and privilege to be appointed the new head of the Faculty. In particular he thanked former Principal Professor Sir

Anthony Newman Taylor for his guidance and support and whose wisdom he hopes to Faculty Finance Officer, Richard Viner continue to benefit within the Faculty.

The past month also saw the London office welcoming colleagues from the Singapore Office. We hosted a three day visit from Ruth Choe, Lydia Tan and Janet Teo and a weeklong visit from Evelyn Leong.

Ruth spent time with members of the Faculty Education Office management team, learning about quality assurance, admissions processes, examinations, and governance and regulations; Lydia spent time with Ann Kelly, the Faculty of Medicine's (FoM) Head of HR Operations; and Janet spent time discussing financial management issues with the FoM and the College's Head of Management Accounting, Sue Ponter.

Evelyn spent the week working with two of our most experienced curriculum managers, Jo Williams and Jitender Yadav, who are respectively responsible for the non-clinical and clinical components of our MBBS course. It was a busy time for us as we geared up to welcome the new intake of students and hopefully the extra help we gained from Evelyn also resulted in her getting some useful hands-on experience to take back to LKCMedicine.

LKCMedicine Editorial Team

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Contributors Professor Michael A. Ferenczi Dr Andrew Ang Dr Naomi Low-Beer

UPCOMING EVENTS

BMAT on November 7th

BMAT are available at www.bmat.org.uk.

Evening with the Dean

Lee Kong Chian School of Medicine