Pushing forth the boundaries

The new building Academia offers a more conducive environment for greater synergies in pathology, medical research and education to raise the benchmarks for better healthcare.

Ahmad Osman

DEFINING tomorrow’s medicine is the vision for SingHealth and the new Academia building at Singapore General Hospital (SGH) campus. This will be achieved through excellent and innovative clinical care, new knowledge from research and development, as well as improved diagnostics and technology to further enhance test and diagnostic accuracy and reliability.

Located within the vicinity of clinical services at SGH campus and Duke-NUS Graduate Medical School, Academia is a key milestone in academic medicine with a vibrant environment for networking and professional collaborations to advance the diagnosis, treatment and innovative care for patients.

The school is SingHealth’s key partner in academic medicine. Its dean, Professor Ranga Krishnan, says: “This partnership is envisioned as an integrated working enterprise that guides and promotes the future of medicine, tapping on and combining the collective strengths of SingHealth’s clinical expertise and Duke-NUS’ biomedical sciences research and medical education.

Planning for Academia, which was opened on July 20, was originally prompted by the need to build capacity for the SGH Department of Pathology and integrate the latest technology into laboratory processes to further enhance test and diagnostic accuracy and reliability.

As planning progressed, it became apparent that the building, jointly funded by the ministry and SingHealth, presented an excellent opportunity to harness the advances in technology and the confluence of the clinical medicine, medical research and education to set new benchmarks to achieve better outcomes for patients.

It is the only building in the SingHealth cluster built specifically with its vision as a central theme. Prof Ng says, adding that expanded and improved pathology services will impact every area of patient care including better and earlier diagnoses and timely decisions for treatment that can enhance patient outcomes.

Academia’s state-of-the-art education facilities include simulation programmes, wet and dry laboratories, operating theatres, centralised and specialist pathology laboratories, and research laboratories, operating theatres, centralised and special-ised test facilities.

It is the location of SingHealth’s Translational Im-mediation Development, a central research facility that will employ the Advanced Molecular Pathology Laboratory and collaborations with the A*Star (Agency for Science, Technology and Research) Genome Institute of Singapore to study individualised or stratified medicine.

"Our goal is to improve the lives of our patients," Prof Ng says. "Research must be done with the aim of better care for our patients. Education is pursued so that we can have better trained and more skilled health-care professionals.

Location of research entities in Academia, Prof Ng notes, will enhance effective and cross-functional collaborations critical for research.

Prof Ng says the aim of these new SingHealth facilities is to seamlessly integrate SingHealth polyclinics is to seamlessly integrate pathology services by over 50 per cent. The new National Heart Centre Singapore building is expected to provide 35,500 annual training places for SingHealth staff and other people from external organisations.

Academia is the first phase of SingHealth’s infrastructure development plan to meet the growing healthcare needs of Singapore’s population. The opening of the new community hospital at Sengkang campus will be opened next year. By 2018, SingHealth General Hospital with an attached community hospital will commence operations. This will be followed by the opening of a community hospital at SGH campus in 2020.

Prof Ng says the aim of these new SingHealth facilities together with SGH, KK Women’s and Children’s Hospital, the national specialty centres and the Duke-NUS Graduate Medical School is to provide patient-centric primary, acute, intermediate and long-term care.
It’s all for the patients

Bigger space, up-to-date equipment and integrated operations will improve the performance of S’pore’s Pathology Clinic

Sally Leir

SINGHEALTH — TOMORROW’S MEDICINE STARTS HERE

Key diagnostic hub in laboratory work

The new state-of-the-art pathology labs at Academia speed up and enhance the diagnostic processes and patient care at Singapore General Hospital

AJ Leow

The department, which has a 215-year history, recently opened a new facility at the newly opened Academia building at the Singapore General Hospital. It will house all the pathology laboratories in the hospital.

Dr Tan says that the department has been given a good chance to rethink and redesign the labs with a safety-first mindset.

"As long as we know the next generation of technology will be solved, the new public will make it a technology to enhance the efficiency of the work. The idea is that we have been able to free up the space for the clinical scientists at SGH’s labs and to use it for better management and research." Dr Tan says.

Academia pathology

At Academia, there is a single consolidated facility allowing fluid workflow and resource sharing.

If the laboratory is to serve the patient needs and to meet the requirements of the workload for the clinical scientists at SGH’s labs, then the new laboratory is one of the key players in the story.

A VITISIATOR entering the eight floor of the new Diagnostic Tower, as they used to be called, may find it hard to believe that this is the place that handles the bulk of the workload for the clinical scientists at SGH’s labs.

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Working with bacteria

Tests to detect a wide range of infections are done in a safe environment where the hazards are minimised

Naradha Apparaoj

A VISITORS to the molecular laboratory of the SGH Pathology Department will find that there is a large array of machines that can detect infections.

"We have been able to free up space for the clinical scientists at SGH’s labs and to use it for better management and research," Dr Tan says.

Safety first

In the spirit of a safe working environment, the lab will be equipped with all the necessary safety equipment and will be monitored in real time.

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Having the new Academy building allowed us to rethink and design our labs with safety in mind. With the experience accumulated over the years, we have incorporated engineering safeguards into our work labs."

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Dr Oon says that with more space available, new machines can be installed, leading to faster and better patient outcomes.

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Looking into computer screens, not only within SGH but also those from Singapore National Eye Centre and the National University Hospital, the lab is in a position to handle more than 2,000 a day — have been automated so that tests to detect a wide range of infections are done in a safe environment where the hazards are minimised.

The lab has spent 20 years with the department, serving as a service, which has contributed to the better management and research of the facility.

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Fighting diseases

Research work in Academia will help to combat the superbugs and develop new antibiotics.

Narinder Aggarwal, Associate Professor and Head, Singapore General Hospital (SGH) pathology department, says: "Our institution has been working on this for some time now and we hold one of the largest superbug collections in the world."

"We have also been researching on how to make the diagnostic tests more effective and efficient and we are exploring new technologies such as next generation sequencing," he says.

"The move to academic medicine is the way forward for treatments and therapies."

Medical ‘twin towers’

Academia will nurture the next generation of doctors and offer researchers a stimulating environment to improve diagnosis and treatments.

Cancer research

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SIMULATION TRAINING ALLOWS HOSPITALS TO PRACTICE IN A FLEXIBLE, STRESS-FREE ENVIRONMENT.

Dr Sim Yirong, a resident in general surgery at Singapore General Hospital (SGH), describes how simulation training allows hospitals to practice in a flexible, stress-free environment.

"The simulation can range from the preparation of patients, where the patient's condition might be vastly different from traditional open surgery, to the various life-like scenarios also enabled by the simulation, such as operating on patients that are stable or unstable patients with a single injury."

The trainees get to review their performances and hence better patient care. It also allows the trainees to see what worked and what didn’t work, and improve their thought processes and learn not to make any jarring mistakes when we have to face a patient in a difficult or challenging scenario.

With the simulation labs, we are now able to brush up our skills in a stress-free environment. The various life-like scenarios also enable us to practise and prepare for the day when we face a patient in a difficult or challenging scenario.

"Trainees will be better off in both skills and confidence of patient service associates when they communicate with patients. This translates to patient safety because when staff know what they are doing, they are less likely to make mistakes. They are able to anticipate the needs of patients, who have fewer complaints," Dr Sim adds.

Mini hospital for doctors

Training facilities equipped with wireless technology and crying manikins make training realistic for the new generation of medical professionals.

Simulated technologies enable nurse educators to better impart valuable skills and heighten confidence levels of trainers

The bridge between science and clinical medicine to achieve rapid diagnoses of diseases for better patient care.

Jamie Ee

"We can simulate life-like scenarios and provide a comprehensive range of molecular tests. From macrophage to circulating tumour cells, we can conduct targeted treatment.

The lab is also fitted with a cardio-pulmonary resuscitation (CPR) manikin to simulate CPR treatment. Through the simulator, we can train the staff in the basic CPR skills and give a targeted treatment.

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At SingHealth, surgeons have been training using simulation technologies for a few years now, but these were done in various locations. In Academia, the computerised simulators are working on, which makes the experience very realistic. The computerised simulators also allow for specific patient data to be keyed in before replicating it on the real patient. To maximise learning, the 24-hour centre can also provide more training opportunities for training surgeons with human-like manikins that simulate a real patient’s physiological changes. These human-like manikins can simulate a real patient’s physiological changes, such as fluctuations in blood pressure, pulse rate and breathing rate, during an operation.

Training surgeons with human-like manikins that simulate a real patient’s physiological changes

The system, called the Suge OR1 Neo, is a state-of-the-art operating theatre system that allows surgeons to gain hands-on experience working in a real operating room — but without real patients. Instead of using mock-ups, trainee doctors and surgeons will use this real equipment to practice various surgical operations, particularly minimally invasive surgery, on “models”. Instead of using mock-ups, trainee doctors and surgeons will use this real equipment to practice various surgical operations, particularly minimally invasive surgery, on “models”.

To provide greater realism, Academia is equipped with a fully functional, state-of-the-art operating theatre system that allows surgeons to gain hands-on experience working in a real operating room — but without real patients. Training surgeons with human-like manikins that simulate a real patient’s physiological changes. These human-like manikins can simulate a real patient’s physiological changes, such as fluctuations in blood pressure, pulse rate and breathing rate, during an operation. The system, called the Suge OR1 Neo, is a state-of-the-art operating theatre system that allows surgeons to gain hands-on experience working in a real operating room — but without real patients. Instead of using mock-ups, trainee doctors and surgeons will use this real equipment to practice various surgical operations, particularly minimally invasive surgery, on “models”.

The Suge OR1 Neo represents the latest in operating theatre system design, where integration is key. It provides controlled and consistent environment with an AV system that allows live transmission of a surgical operation to other seminar rooms and vice versa. The equipment costs $3.8 million, which also includes 10 minimally invasive surgery operating towers that can be used individually and simultaneously for training surgeons. Each tower is linked to the central Suge OR1 Neo system to allow trainees to view the procedures at each training suite from the master table and vice versa.

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This feature on the Academia is made possible by generous support from the following valued partners:

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Academia in the making

We are proud to work with SingHealth to make Academia a reality. For us, it has been more than just constructing a facility. It is the privilege of co-creating spaces that will contribute to making healthcare diagnosis and treatment better. From design to construction, our focus has been to deliver a stimulating and collaborative environment that connects healthcare professionals at SGH Campus, Singapore and beyond. As a team, we thank SingHealth for sharing with us this transformative journey toward better healthcare outcomes.

Congratulations on the official opening of Academia!