MEDIA RELEASE
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New Healthcare Innovation Centre Launched at SingHealth Duke-NUS Scientific Congress 2023

- *The Alice Lee Innovation Centre of Excellence @ SGH Campus aims to accelerate healthcare innovations such as medical technology and digital healthcare solutions. It houses SingHealth's new supercomputer, CHROMA, to advance large-scale and complex healthcare research.*
- *The two-day Scientific Congress also unveiled population health and innovation projects including digital healthcare solutions EMPOWER and Dr Buddy, and a SingHealth-Microsoft collaboration on generative AI.*

Singapore, 22 September 2023 – Minister for Manpower and Second Minister for Trade and Industry, Dr Tan See Leng, opened the seventh SingHealth Duke-NUS Scientific Congress 2023 today. At the opening ceremony, Minister Tan launched the SingHealth Duke-NUS Academic Medical Centre's (AMC) Alice Lee Innovation Centre of Excellence @ Singapore General Hospital Campus (A.L.I.C.E @ SGH Campus), a new innovation centre designed to accelerate the development and adoption of healthcare innovations such as medical technology and digital healthcare solutions.

A.L.I.C.E @ SGH Campus – A Bold Step Forward in Fostering a Healthcare Innovation Ecosystem

A.L.I.C.E @ SGH Campus is the first of several innovation centres which will open across SingHealth's hospital campuses. Located at the SingHealth Tower, the Centre is a 590-square-metres purpose-built living laboratory for brainstorming, prototyping, and test-bedding of innovations. It catalyses collaborations between clinicians, healthcare innovators and multidisciplinary industry partners to enable process redesign and care transformation, as well as incubates and houses startups and spin-off companies at its company suites.

One of the Centre's key features is a new supercomputer and SingHealth's first, called Computational Health Research and Optimisation for Medical Advancements (CHROMA), which was made possible through a partnership with the National Supercomputing Centre (NSCC) Singapore. CHROMA has high-performance computing capabilities that enables the processing and research of large amounts of clinical data. For example, it will allow clinicians and healthcare innovators to pre-train artificial intelligence (AI) models for large-scale and complex research for applications such as developing AI algorithms for disease

risk prediction and facilitate personalised medicine. Together with access to anonymised, real-world clinical data, SingHealth clinician scientists will be able to simulate, test and validate new AI models for improving patient care.

Associate Professor Tan Tin Wee, Chief Executive of NSCC, said, “A.L.I.C.E @ SGH Campus marks a remarkable milestone in the advancement of healthcare innovation. With state-of-the-art facilities and NSCC-SingHealth's new supercomputer CHROMA, we are empowering clinicians and healthcare innovators to push the boundaries of research with high performance computational and AI applications in healthcare. This collaboration between NSCC and SingHealth opens new horizons for large-scale and computationally complex healthcare research. We are excited to see the transformative impact it will have on healthcare in Singapore and beyond."

A.L.I.C.E @ SGH Campus is also equipped with innovation facilities and tools such as 3D design and simulation software, 3D printers, a prototyping laboratory, and white space for collaborators to design and develop their proof-of-concept models.

The Centre is named after Mrs Alice Lee, wife of the Lee Foundation’s founder, the late Lee Kong Chian, in recognition of a transformational $50 million donation from the Lee Foundation to advance innovation and research across the SingHealth Duke-NUS AMC.

Professor Ivy Ng, Group CEO, SingHealth, said, “The opening of A.L.I.C.E @ SGH Campus, the first innovation centre situated on our biggest campus, is a significant milestone in our efforts to improve care through innovation. A.L.I.C.E will bring together capabilities, software and hardware, including the new NSCC-SingHealth supercomputer, to spur new innovations and medical technologies. It will also catalyse new partnerships between our innovators and industry partners to generate new ideas, prototypes and smart technologies for better disease prevention, diagnoses and treatment. The Centre’s co-location with our institutions on the SGH Campus is strategic, so that healthcare professionals can bring unmet clinical needs to the innovation table, and work with partners to ideate and test potential solutions in a real-world setting. We look forward to bringing more bench-to-bedside innovations to our patients and improving clinical outcomes as projects come to fruition through the network of A.L.I.C.E across all our campuses.”

Professor Thomas Coffman, Dean, Duke-NUS, said, “As Singapore’s healthcare system transforms into one focused on empowering people to lead healthier lives for longer, scientists and healthcare professionals face an expanded arena for innovation that stretches all the way into the community and people’s homes. A.L.I.C.E is the first node of a new network that will spur bench-to-bedside innovation at the SingHealth Duke-NUS AMC,

adding to the vibrancy of our academic campuses by bringing new technologies and resources like the supercomputer, to the repertoire of tools and technologies available to our clinician-scientists and innovators. In partnership with healthcare professionals from across the AMC, the new Centre will empower our people to develop, test and prototype their ideas and, in collaboration with commercial partners and startups, translate these into solutions that support people to lead healthier lives at home, in communities, schools and workplaces."

Population Health and Innovation Projects to Improve Healthcare Accessibility and Optimise Healthcare Manpower

Themed "Advancing Frontiers in Population Health through Academic Medicine", the Scientific Congress 2023 showcased new population health initiatives and innovation projects that sought to advance patient care and healthcare in the community.

i) EMPOWER

SingHealth and the National University of Singapore (NUS) School of Computing jointly developed the EMPOWER app to improve chronic disease management for prevalent conditions such as diabetes and hypertension. The app uses AI to provide personalised and timely notifications to remind users to engage in healthy lifestyle choices and behaviours. For example, it leverages a Deep Convolutional Neural Network and smart AI technologies such as image recognition and image classification to detect different food types to determine if users are eating well and provide relevant dietary recommendations. Refer to Annex A for more information on EMPOWER.

ii) Dr Buddy

Dr Buddy, a telehealth solution co-developed by SingHealth and the A*STAR Institute of High-Performance Computing, is a smart chatbot and clinician dashboard that supports SingHealth's Mobile Inpatient Care @ Home" initiative. SingHealth's Mobile Inpatient Care @ Home is a "virtual ward" concept where clinically stable patients get transferred from the physical hospital ward to recover at home while being closely monitored by the healthcare team. Dr Buddy facilitates remote patient monitoring with patients providing input of their health data, such as vital signs, into it. Dr Buddy will soon be incorporating an Application Programme Interface connectivity so that patients' health data can be automatically transmitted from health monitoring devices into Dr Buddy in real time. This will improve the accuracy, efficiency, and timeliness of data collection to better support recovery at home. Refer to Annex B for more information on Dr Buddy.

i) SingHealth-Microsoft collaboration on generative AI

SingHealth is building a solution that integrates Microsoft Azure OpenAI Service to help doctors and nurses formulate discharge summaries and medical reports, as well as to convert verbal consultations with patients into structured clinical notes. The solution, which will be rolled out across the SingHealth cluster, will allow the clinical team to focus and spend more time on their interactions with patients, while AI captures and translates information from consultations and clinical interactions into reports and notes. Refer to Annex C for more information on the SingHealth-Microsoft collaboration.

About the SingHealth Duke-NUS Scientific Congress

The SingHealth Duke-NUS Scientific Congress is a distinguished biennial healthcare and scientific event in Singapore that brings together thought leaders and healthcare professionals to share insights in care improvement, research, and education to improve patients' outcomes.

Themed “Advancing Frontiers in Population Health through Academic Medicine”, the two-day event covers a wide range of research and education-related topics that reflect the evolving healthcare concerns brought about by evolving disease patterns. This year’s event saw about 2,500 delegates in attendance and more than 290 scientific abstract submissions being presented.

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About SingHealth Duke-NUS Academic Medical Centre

The SingHealth Duke-NUS Academic Medical Centre (AMC) draws on the collective strengths of SingHealth and Duke-NUS Medical School to provide our patients and community with the best outcomes and experience.

By leveraging the synergies in clinical care, research and education created through our Academic Clinical Programmes, Disease Centres and Joint Institutes, the SingHealth Duke-NUS AMC fosters the exchange of scientific knowledge and clinical perspectives to accelerate innovation and new discoveries, advance the practice of medicine as well as nurture the next generation of healthcare professionals.

SingHealth delivers comprehensive, multi-disciplinary and integrated care across a network of acute hospitals, national specialty centres, polyclinics and community hospitals. Offering over 40 clinical specialties, SingHealth is Singapore's largest public healthcare cluster.

Duke-NUS, Singapore's flagship graduate-entry medical school, nurtures 'Clinician Plus' graduates to become leaders in the global healthcare and biomedical ecosystem, while scientists from its five Signature Research Programmes and 10 Centres transform medicine and improve lives in Asia and beyond.
For more information, please visit:
www.singhealthdukenus.com.sg
www.singhealth.com.sg
www.duke-nus.edu.sg

Annex A
EMPOWER App for Chronic Disease Management

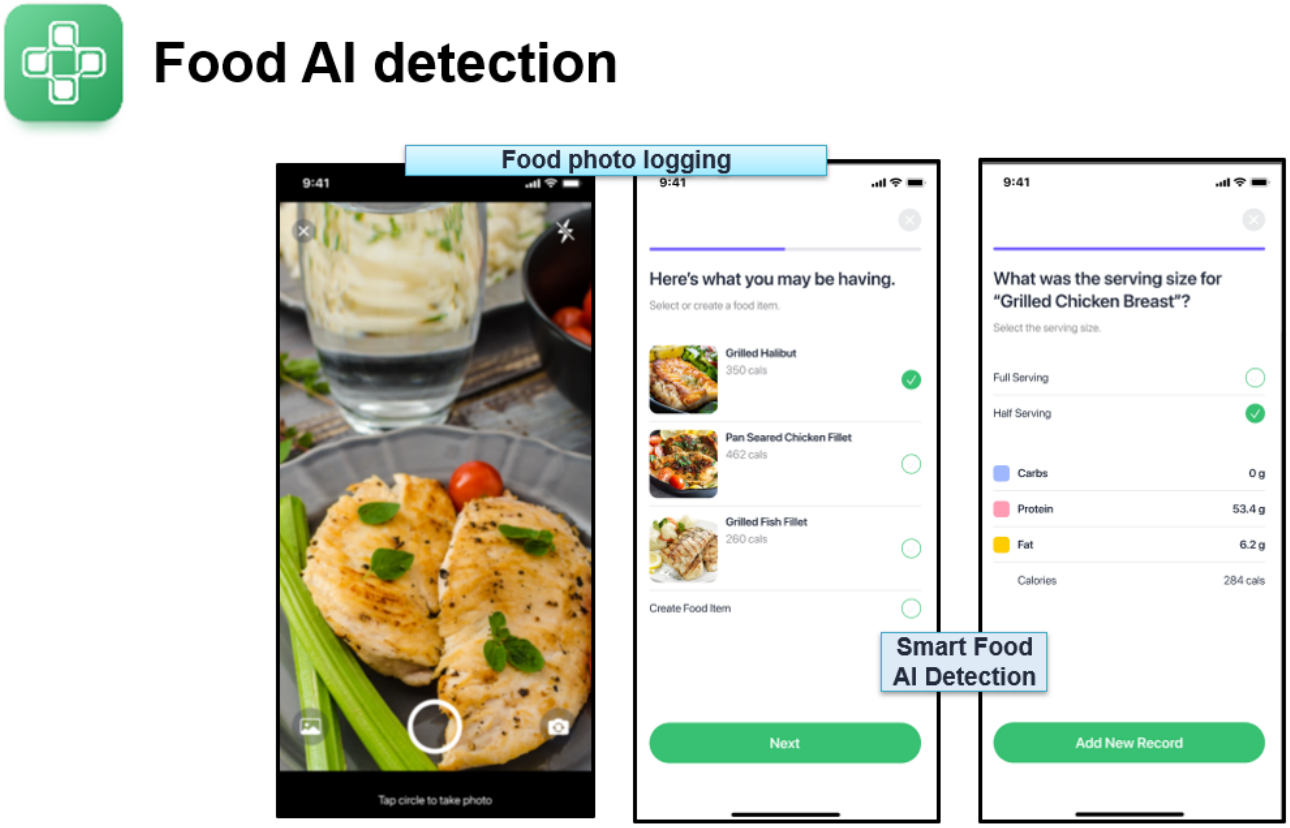
SingHealth and the NUS School of Computing jointly developed EMPOWER, a mobile application to improve chronic disease management for prevalent conditions such as diabetes and hypertension. The app uses AI to provide personalised and timely notifications to remind users to engage in healthy lifestyle choices and behaviours, including adhering to a healthy diet, doing regular exercises, and complying with their medication schedule.

For example, the app analyses user data using Artificial Neural Network to predict if an individual is likely to achieve 30 minutes of moderately vigorous physical activity each day, and reminders are triggered to encourage the user to increase his or her level of physical activity, if required. It also leverages Convolutional Neural Network for image recognition and image classification to detect different food types to determine if users are eating healthily and provide the relevant dietary recommendations, as necessary[1]. An AI-supported chatbot or live chat with a health coach or healthcare professional – depending on the user's needs – is available in the EMPOWER app so that users can clarify questions or receive advice on managing their chronic condition.

Interim analysis of a randomised controlled trial conducted by the team on diabetic users of the app demonstrated tangible benefits, including increased physical activity and, notably, a statistically significant improvement in HbA1c (glycosylated haemoglobin) levels after the three-month follow-up, with some patients having sustainable improvements at the 12th month. Since its roll-out in 2021, EMPOWER has been tested in a large clinical trial involving 1,000 diabetes patients. A second trial involving 320 diabetes patients to evaluate advanced features and health coaching is ongoing. It is currently available for download on the Apple App Store and Google Play Store for trial participants and will be progressively made available to the public.

Associate Professor Low Lian Leng, Director, SingHealth Centre for Population Health Research and Implementation and Chief Medical Informatics Officer, SingHealth Regional Health System, said, "The EMPOWER app is akin to a healthcare companion for patients with chronic diseases such as diabetes and hypertension. The app's AI capabilities helps patients to better keep track of their health and lifestyle habits, sends out personalised nudges based on their needs, and provides them with access to health advice. Smart technological tools like EMPOWER are important in enabling us to achieve a Heathier SG, where patients and the community can better manage their chronic conditions and take charge of their health.

1. Screenshot of the EMPOWER app's AI food detection feature.



Annex B
Dr Buddy for SingHealth's MIC @ Home Initiative

Under the Ministry of Health's Mobile Inpatient Care (MIC) @ Home programme, SingHealth introduced its MIC @ Home initiative. One example is the Singapore General Hospital @ Home (SGH@Home) programme, a "virtual ward" concept where clinically stable patients recover at home while being closely monitored by a multidisciplinary healthcare team.

To facilitate this initiative, SingHealth and the A*STAR Institute of High-Performance Computing (IHPC) co-developed 'Dr Buddy', a customisable telehealth solution comprising a chatbot and a clinician dashboard. Dr Buddy allows for patients to self-report their health data, such as vital sign readings, which flows into the healthcare team's dashboard for remote patient monitoring. It also includes other features such as the customising of clinical parameters for each patient and monitoring regime based on the patient's condition, and automated push messages including curated healthcare tips and timed nudges to remind patients to take their medication. Since October 2021, SGH@Home and Dr Buddy have resulted in a reduction of more than 1,200 admissions and saved more than 8,300 SGH bed days by scaling virtual bed capacity. During COVID-19, these initiatives also enabled the management of up to 100 virtual beds for the hospital at any one time.

To further enhance this solution, SingHealth and the A*STAR IHPC are working with a private technology solutions company to pilot Application Programme Interface (API) connectivity – a software that allows different technological applications to "talk" to each other – across different health monitoring devices. With API, patients' health data could be automatically transmitted from the health monitoring devices into Dr Buddy in real-time, improving the accuracy, efficiency, and timeliness of data collection. There are also plans to develop an artificial intelligence (AI)-augmented Virtual Concierge for Dr Buddy that provides individualised patient management services to enable patient care anywhere and anytime.

Annex C
SingHealth collaboration with Microsoft on generative AI

SingHealth is collaborating with Microsoft to empower the healthcare industry with new data and AI solutions for a digitally resilient Singapore. The scope of the collaboration includes the transformation of its healthcare digital workforce to optimise productivity through Microsoft 365 across the entire continuum of care as teams share information and collaborate efficiently, deliver patient-centric care and integrate secure AI into patient encounters.

Both organisations are also developing new ways for doctors and nurses to use generative AI to formulate discharge summaries and medical reports, as well as to convert verbal consultations with patients into structured clinical notes. This will allow the clinical team to focus on patient interactions, while the use of AI will efficiently and effectively capture and generate the relevant clinical information into useful reports and notes.

Benedict Tan, Group Chief Digital Strategy Officer & Chief Data Officer, SingHealth, said, “New digital solutions such as generative AI will help us optimise healthcare operations and resources to improve care delivery. We are privileged to work with Microsoft in upskilling our healthcare professionals in the use of smart technologies such as generative AI, as we continuously explore ways of leveraging digital technologies as a resource multiplier while ensuring that delivery of care continues to be safe and efficient.”

SingHealth will also deliver self-paced and instructor-led virtual training with help from Microsoft to build technical skills and knowledge around security, data and AI as well as collaboration tools. These skills can then be applied across the Microsoft Cloud.

"We are pleased to collaborate with SingHealth in providing their healthcare professionals with the competencies and expertise in digital technologies to optimise healthcare operations and resources by improving the quality, efficiency, and accessibility of care. Generative AI has immense potential to empower the healthcare workforce to concentrate on enhancing patient experiences by automating administrative tasks with smart technologies,” said Lum Seow Khun, Director of Public Sector Group, Microsoft Singapore.