

CREATE SYMPOSIUM 2026

Bringing together global research leaders to advance understanding of climate, environment, health, and urban resilience

Singapore, 25 June 2026 – The CREATE Symposium 2026, themed "Climate, Environment, Health and Urban Resilience", brought together 200 distinguished participants to explore how Singapore's urban environment shapes public health outcomes. The Symposium, organised by the National Research Foundation, Singapore (NRF), gathered eminent scientists and leading international research institutions to share pioneering research and solutions to confront challenges the world is facing such as rising temperatures, ageing populations, and mounting health challenges.

2 The event was launched by Guest-of-Honour Mr Heng Swee Keat, Chairman of the NRF, and was attended by members of the CREATE Governing Council, public agency representatives, industry stakeholders, and local and international research collaborators. In his opening address, Mr Heng underscored Singapore's commitment to interdisciplinary research, stronger science-policy linkages, and research that delivers real-world impact on climate, environmental, and urban health challenges.

Discussions with experts for real-world solutions and impact

3 The Symposium featured a line-up of leading experts, including Prof Nick Wareham (University of Cambridge), Prof Frank Kelly (Imperial College London, ICL), Prof Carlo Ratti (Massachusetts Institute of Technology, MIT), Prof Koh Woon Puay (National University of Singapore, NUS), and Prof Frédéric Thomas (Centre National de la Recherche Scientifique, CNRS), who led discussions on urban drivers — including air quality, noise, water, food systems, and heat resilience — and their effects on the physical and mental well-being of children, working adults, and the elderly. The discussions highlighted data-driven approaches to tracking environmental exposures and non-communicable diseases, and showcased strategies in monitoring, urban design, and policy to build a healthier, more resilient Singapore.

4 At the Symposium, CREATE Partners presented innovations and technologies addressing sustainability, environmental, and health challenges in Singapore and beyond, through talks, poster presentations, and booth showcases. Across ten world-leading universities and research institutions — Berkeley Educational Alliance for Research in Singapore (BEARS), Cambridge Centre for Advanced Research and Education in Singapore Pte Ltd (CARES), CNRS@CREATE, Imperial Global Singapore (IGS), Illinois Advanced Research Centre at Singapore (Illinois ARCS), Singapore-ETH Centre (SEC), Singapore-HUJ Alliance for Research and Enterprise (SHARE), SJTU Asia-Pacific Graduate Institute (SJTU-APGI), Singapore-MIT Alliance for Research and Technology (SMART), TUMCREATE — CREATE brings together complementary expertise in AI, synthetic biology, digital health, and robotics to deliver practical, scalable solutions to real world problems. The attached **annex** provides examples of

projects by CREATE Partners. For more information on their work in CREATE, please refer to the respective entities' webpages.

5 **Professor Tan Chorh Chuan**, Permanent Secretary (National Research and Development) said, "The CREATE Symposium exemplifies the spirit of international collaboration that is a critical pillar of Singapore's Research, Innovation and Enterprise 2030 (RIE2030) plan. The research conducted by our CREATE Partners together with local institutions addresses important issues in environmental health, urban systems, and human well-being, that are advancing a key RIE2030 goal which is to build a more sustainable, healthy, and resilient Singapore. The insights and discoveries from this collaborative work will not only benefit Singapore, but also contribute meaningfully to the global effort to build cities that are better equipped to protect and improve the lives of their residents."

About CREATE

CREATE (Campus for Research Excellence and Technological Enterprise) brings together world-class research institutions in one location in Singapore and establishes institutional partnerships that provide a strong pipeline of ideas, talent, and research capabilities. This enhances the vibrancy of Singapore's Research, Innovation and Enterprise (RIE) ecosystem and accelerates capability-building in selected priority areas.

About the National Research Foundation, Singapore (NRF)

The National Research Foundation is a department within the Prime Minister's Office. The NRF sets the national direction for research and development (R&D) by developing policies, plans and strategies for research, innovation and enterprise. It also funds strategic initiatives and builds up R&D capabilities by nurturing research talent. The NRF aims to transform Singapore into a vibrant science and technology hub, with R&D contributing significantly to a knowledge intensive, innovation and entrepreneurial economy.

List of CREATE Partners' Factsheets

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Berkeley Education Alliance for Research in Singapore (BEARS)

About “Heat Exposure, AcTivity, and Sleep” (HEATS) programme

Singapore ranks as the third most sleep-deprived city in the world, a challenge that is poised to deepen as climate projections indicate 312 warm nights annually by 2050. HEATS is a three-year, multi-institutional research initiative that unites expertise from the University of California Berkeley, the National University of Singapore, and The University of Sydney to develop technological and behavioural solutions aimed at mitigating the adverse effects of heat exposure on sleep quality.

How does the project/innovation work?

The project comprises four integrated research streams: (1) Continuous physiological and environmental monitoring of over 100 working-age participants across several months to establish an evidence-based understanding of how heat exposure impacts sleep; (2) Deployment of AI-driven personalised nudging strategies to optimise sleep environments; (3) Development and evaluation of a control strategy for air conditioners and fans for residential homes; and (4) Development and evaluation of a smart ventilation system for worker dormitories, addressing conditions in shared quarters. Collectively, these workstreams integrate longitudinal field data, engineering innovation and digitally enabled behavioural intervention, underpinned by multidisciplinary expertise spanning thermal physiology, sleep science, indoor environmental quality, thermal comfort and machine learning.

What the project/innovation aims to achieve, or what is its impact on society/industry?

HEATS seeks to achieve measurable improvements in sleep outcomes for populations affected by heat exposure, including outdoor workers in tropical climates and in the context of accelerating global temperatures. Through scientifically validated cooling technologies and scalable digital interventions, HEATS is positioned to enhance quality of life, support daytime productivity and reduce heat-related health risks. The findings are expected to contribute to housing design standards, workplace health policies and public health frameworks across heat-affected regions, extending beyond Singapore to cities worldwide.

About BEARS

BEARS (Berkeley Education Alliance for Research in Singapore) is a University of California-wide research initiative established in 2011 to foster collaborations between Singapore and the University of California system. It serves as a platform for advancing scientific discovery, technological innovation, and talent development through partnerships among academia, government, and industry, focusing on areas including energy, health, sustainable buildings and advanced manufacturing. By bringing together interdisciplinary teams, BEARS addresses global challenges and translates discoveries into practical solutions with societal and economic impact, while strengthening international partnerships and contributing to innovation-driven economic growth in both regions. For more information on BEARS’s other projects, please visit: <https://www.bears.berkeley.edu/>

Cambridge Centre for Advanced Research and Education in Singapore (CARES)

About “Centre for Lifelong Learning and Individualised Cognition” (CLIC) programme

Beyond IQ and grades, the CLIC aims to improve support for lifelong flexible learning and cognitive agility. At the core is cognitive flexibility, the capacity to shift strategies, test ideas, and learn regardless of feedback. CLIC aims to make this ability more observable in the classroom by developing methods to distinguish students' flexible thinking and behaviour in real learning situations.

How does the project/innovation work?

CLIC is actively turning laboratory insights into school-based tools, professional development activities, and partnerships with teachers and school communities. A key part of this work involves adapting lab-based cognitive tasks into activities that are more relevant and engaging in school settings. For example, CLIC has been developing gamified and context-rich tasks such as a bridge-building task, which draws on basic physics knowledge and requires students to test, revise, and improve their solutions. CLIC have also introduced the concept of cognitive flexibility to teachers and parents via workshops; several in conjunction with the Singapore Examination and Assessment Board.

What the project/innovation aims to achieve, or what is its impact on society/industry?

CLIC advances interdisciplinary research and connects insights from cognitive science to meaningful pedagogy, classroom practice, and seamless learning. CLIC's work focuses on helping learners across the lifespan become adaptive, creative, and resilient, helping Singapore students become more flexible and inventive problem-solvers.

About CARES

The Cambridge Centre for Advanced Research and Education in Singapore (CARES) was established in 2013 as the University of Cambridge's first overseas research centre outside the UK. CARES has supported over S\$160 million in research funding for programmes in low-carbon chemical technologies for the manufacturing, energy, and transport sectors; since 2020, this portfolio now includes projects related to human health and potential, such as lifelong learning, the impact of the built environment on health and behaviour, and improving healthcare using AI. CARES has demonstrated capabilities in fundamental research with over 800 papers published, and a drive for innovation with 34 invention disclosures, 20 patent filings, and 5 active spin-off companies in Singapore. For more information on CARES's other projects, please visit: <https://www.cares.cam.ac.uk/>

CNRS@CREATE

About “Intelligent modelling for Decision-making in critical urban systems” (DesCartes) programme

The DesCartes Programme is a five-year, multidisciplinary initiative hosted by CNRS@CREATE and funded by NRF. It develops hybrid AI combining physics-based models and data-driven learning to support smarter, more sustainable decision-making in complex urban systems. Led by Prof. Francisco Chinesta (ENSAM Paris School of Engineering, France), it delivers real-time, frugal, and trustworthy hybrid digital twins to simulate scenarios, anticipate risks, and support operations optimisation and crisis management.

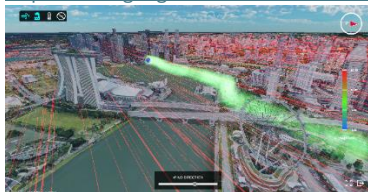
How does the project/innovation work?

DesCartes builds hybrid digital twins (virtual replicas combining physical simulation and frugal AI) to run fast, accurate simulations in real time. These tools support “what-if” scenarios across five domains: environmental modelling, drone mobility, digital energy, predictive maintenance, and crisis management. It adopts a human-centred approach and works with Singapore agencies and industry partners to translate research into deployment.

What the project/innovation aims to achieve, or what is its impact on society/industry?

DesCartes delivers practical AI tools for safer, more resilient, and sustainable cities. Its flagship Marina Bay Hybrid Twin models urban climate and infrastructure, and in a chemical incident can identify sources, predict pollutant spread, and recommend evacuation routes (validated with HTX). Four projects with agencies (HTX, DSO, NEA, SMI) support national roadmaps, and the programme has spun out Duoverse (2024) to advance deployment. Backed by S\$30M and over S\$16M in contributions, DesCartes aligns with Singapore’s RIE2025 priorities on climate adaptation, sustainable urban development, and citizens’ well-being.

<https://drive.google.com/drive/folders/1-6lrLWnOI4p4DPH5sj-w9uuP9N1u1F2?usp=sharing>



User interface of the CNRS@CREATE DesCartes Programme wind map. The DesCartes hybrid twin model allows the user to predict air pollution flows in real-time.

About CNRS@CREATE

CNRS@CREATE is the first overseas subsidiary of the French National Centre for Scientific Research (CNRS), established in 2019 within Singapore’s CREATE campus in partnership with the National Research Foundation (NRF). Sitting alongside nine other world-renowned institutions, it conducts transdisciplinary research that develops concrete solutions to human, energy, environmental, and urban challenges. Through this unique Franco-Singaporean ecosystem, CNRS@CREATE strengthens scientific cooperation between France and Singapore and bridges fundamental research, applied innovation, and industry engagement. For more information on CNRS’s other projects, please visit: <https://www.cnrsatcreate.cnrs.fr/>

IMPERIAL GLOBAL SINGAPORE

Imperial Global Singapore (IGS)

About “Imperial/NTU CYber Protection for HEalthcaRe” (IN-CYPHER) programme

IN-CYPHER is a joint programme between IGS and NTU that protects patients from security vulnerabilities in medical devices and hospital systems. Devices such as insulin pumps, pacemakers, and wearables, together with hospital systems (e.g. electronic patient records and scanners), are increasingly internet-connected and exposed to cyber threats. IN-CYPHER develops the technology, methods, and partnerships needed to make this new generation of connected medical technology safer, more resilient, and trustworthy, supporting safer and more efficient healthcare delivery.

How does the project/innovation work?

IN-CYPHER operates in three reinforcing strands. First, it develops tamper-resistant chip “fingerprints” so devices can verify their authenticity before acting on commands. Second, it uses AI as an automated security tester to probe real medical devices and hospital software, uncovering hundreds of previously unknown vulnerabilities faster and more comprehensively than manual testing. Third, it validates solutions in clinical contexts, with diabetes as the initial use case. The programme has built a laboratory testbed for automated insulin delivery systems and a simulated multi-department hospital environment to safely study cyberattacks and defence strategies. It also draws on SG100k health data to identify markers for more personalised therapy and develops sensing technologies to enable next-generation secure medical devices.

What the project/innovation aims to achieve, or what is its impact on society/industry?

IN-CYPHER aims to make Singapore and patients globally safer from medical-device cyber risks, while positioning Singapore as a hub for trustworthy medical-device cybersecurity. Researchers have identified over a hundred vulnerabilities across widely used systems, enabling fixes to be implemented before harm occurs. The programme works with industry, healthcare infrastructure, and start-ups to translate research into practice, while training talent at the intersection of cybersecurity, AI, and biomedical engineering, strengthening capabilities for the sector.

About IGS

Imperial Global Singapore is Imperial College London’s research and innovation hub for the ASEAN region. Imperial is a STEMB university ranked second in the QS World Rankings 2025, with partnerships in 192 countries and a community of more than 150 nationalities, all working together to deliver its science for humanity mission. The Singapore hub works in partnership with government, industry, academia, funders, and innovators to find solutions to global challenges in health, energy, sustainability, decarbonisation and more. Expertise in cutting edge technology combined with a convergence science approach enables scientists to rapidly scale new breakthroughs and applications to societal benefit and commercialisation in Singapore and beyond. For more information on IGS’s other projects, please visit: <https://www.imperial.ac.uk/about/global/singapore/>

Illinois Advanced Research Center at Singapore (Illinois ARCS)

About “Centre for Precision Fermentation and Sustainability” (PreFerS) programme

Global food systems face challenges in food security, sustainability, and environmental health. Precision fermentation enables the sustainable production of food ingredients using engineered microorganisms as efficient cell factories. Advances in synthetic biology, genome engineering, and bioprocessing expand the range of nutritious and functional ingredients while reducing resource use and emissions. PreFerS aims to enable the safe, cost-effective, and sustainable production of nutritious foods, with a focus on addressing micronutrient insecurity (“hidden hunger”) through microbial platforms for essential vitamins and proteins, contributing to a more resilient and nutritionally secure food system.

How does the project/innovation work?

PreFerS delivers its innovation solutions through two integrated research thrusts:

- **Microbial Cell Engineering:** Develops food-safe microorganisms as cell factories for the production of high-value food ingredients and nutrients. Genome engineering and synthetic biology are employed to enhance the production of target products while preserving the desirable characteristics of the host organism, ensuring the safe and sustainable production of food ingredients for human consumption.
- **Bioprocess Engineering:** Designs and optimizes microbial fermentation and downstream processing (DSP) technologies to maximize product yield, quality, and process efficiency while minimizing waste and environmental impact. DSP strategies are developed to efficiently recover and purify target products from fermentation broths. Techno-Economic Analysis (TEA) and Life Cycle Assessment (LCA) are integrated to ensure that the overall process is cost-effective, commercially viable, and environmentally sustainable.

What the project/innovation aims to achieve, or what is its impact on society/industry?

PreFerS integrates microbial engineering and bioprocess engineering technologies to accelerate the commercialization of next-generation food ingredients. Its innovations have the potential to improve food security, address micronutrient deficiencies, reduce greenhouse gas emissions, and strengthen supply-chain resilience. By translating scientific discoveries into commercially viable solutions, PreFerS supports the growth of the alternative protein and precision fermentation industries while contributing to global efforts toward a more sustainable and climate-resilient food system.

About Illinois ARCS

The Illinois Advanced Research Center at Singapore Ltd. (Illinois ARCS) is an affiliated Singapore company of the University of Illinois Urbana-Champaign (Illinois) and is part of the National Research Foundation’s Campus for Research Excellence and Technological Enterprise (CREATE) since 2017. Its core research programs aim to address complex global challenges in areas such as sustainability, health, and advanced technologies. For more information on IARCS’s other projects, please visit: <https://illinois-arcs.edu.sg/>

(SEC) SINGAPORE-ETH CENTRE

Singapore-ETH Centre (SEC)

About “Future Health Technologies” (FHT) programme

Singapore’s population is ageing, placing increasing pressure on healthcare systems, families, and communities. The FHT programme develops and tests practical digital and AI-enabled healthcare solutions that can help people stay healthy, independent, and active for longer. FHT phase 1 (FHT1) (2020–2026) focused on developing and testing these technologies, while FHT phase 2 (FHT2) (2026–2031) will bring the most promising solutions into hospitals, communities, and homes but also exploring new avenues of research.

How does the project/innovation work?

FHT1 developed and tested a broad range of technologies to support healthy ageing. These included SPACE, a digital tool for early dementia screening tested with 1,300 participants; low-cost mobile assessments of walking patterns and fall risk used with over 4,000 participants; and digital models to predict hip-fracture risk, developed using data from 3,000 participants. The programme also tested the LvLUP smartphone app with 700 participants to support healthier lifestyles, and developed RehabGym, a rehabilitation platform combining robotic devices and digital tools to support stroke recovery in both hospital and home settings. Building on this work, FHT2 will focus on translating these technologies into routine healthcare use. The programme will expand fall-risk assessment into hospital settings using AI and computer vision, enhance personalised prediction of fracture risk, and develop laboratory-based models to identify suitable bone-strengthening treatments for different patients. It will also develop AI-supported digital health coaching tools to promote mental wellbeing, behavioural change, and cognitive health in the community, while advancing technologies to improve robot-assisted rehabilitation after stroke.

What the project/innovation aims to achieve, or what is its impact on society/industry?

The goals of the FHT programmes are to help people maintain, protect, or regain their physical and cognitive abilities throughout life. By combining AI, digital health tools, sensors, rehabilitation technologies, and close collaboration with healthcare and community partners, the programmes aim to make care more personalised, accessible, and cost-effective. Ultimately, FHT seeks to support healthier ageing by helping more people live longer lives in good health, while also reducing pressure on healthcare systems. Its solutions are designed for use across the full care journey - from prevention and early detection to treatment, rehabilitation, and long-term support in hospitals, communities, and homes.

About SEC

The Singapore-ETH Centre (SEC), established in 2010 as a partnership between ETH Zurich and Singapore’s National Research Foundation, serves as a platform for science–policy collaboration. It brings together Swiss and Singapore R&D capabilities to address challenges in sustainable urban systems, climate change, and human health, while expanding into areas such as AI for Science, high-performance computing, and education. As an innovation test-bedding platform, SEC advances scientific excellence and integrates research with policymaking and agency practice to drive translation and impact. Close engagement with stakeholders, including planners, regulators, and practitioners, enables new technologies and frameworks to be piloted in real-world settings and scaled for adoption. For more information on SEC’s other projects, please visit: <https://sec.ethz.ch/>



Singapore-HUJI Alliance for Research and Enterprise (SHARE)

About “Smart Grippers for Soft Robotics” (SGSR) programme

SGSR is a research programme in the field of soft robotics that is based on a collaboration between HUJI and NTU with the participation of Singapore University of Technology and Design (SUTD). The research in this programme is devoted towards fabrication of soft, smart grippers. Gripping and holding of objects are key tasks for robotic manipulators. The programme focuses on investigating and developing simultaneous gripping and sensing which is based on principles of soft robotics that can adapt and conforms autonomously to the surface of the target object, while addressing the unmet needs in the field of soft robotics. The programme is built on three main pillars of interconnected activities: Actuation, Sensing and Control, and is based on the complementary expertise of the PIs in Materials Science, Robotics, Chemistry, and Control.

How does the project/innovation work?

The SGSR programme develops new “soft hands” for robots that can gently and safely handle delicate, irregular objects in everyday settings. The team combines advanced soft materials, 3D printing and clever sensing and control to create grippers that can both hold and “feel” what they touch. These prototypes are already being demonstrated in realistic environments, such as automated harvesting of leafy vegetables in vertical farms, rehabilitation gloves powered by soft pumps, and smart prosthetic or robotic hands that can sense force, slip and temperature. Together, these efforts position Singapore as a leader in soft robotics with clear pathways to impact in areas like agriculture, healthcare, manufacturing and healthy ageing.

What the project/innovation aims to achieve, or what is its impact on society/industry?

The programme aims to improve robots’ ability to handle delicate, unpredictable real-world objects and translate this into practical tools for farms, factories, hospitals and homes. It develops soft robotic grippers that can safely grasp fragile items — from flowers and vegetables to medical devices and consumer products — while sensing force, slip and contact in real time, allowing robots to adjust their grip automatically instead of breaking or dropping items. For society, the intended impact is safer and more accessible automation, including support for crop harvesting in indoor vertical farms, soft rehabilitation and assistive devices for older adults and patients, and prosthetic or wearable systems that restore or enhance touch. For industry, the programme targets higher productivity and new product lines by automating tasks that remain too delicate or variable for conventional rigid robots, while reducing damage, labour costs and downtime. Over time, these technologies could support wider adoption of gentle robotic handling and human–robot collaboration across agri-food, healthcare, logistics and advanced manufacturing.

About SHARE

The Singapore-HUJI Alliance for Research and Enterprise (SHARE) is a Hebrew University of Jerusalem (HUJ) centre for research, graduate education, and innovation. SHARE serves as an intellectual hub for interactions between the Hebrew University researchers and their counterparts from Nanyang Technological University (NTU) and the National University of Singapore (NUS). SHARE is funded by the government of Singapore through the National Research Foundation (NRF), under the Campus for Research Excellence and Technological Enterprise (CREATE). SHARE is a non-profit company owned by the Hebrew University of Jerusalem. For more information on SHARE’s other projects, please visit:

<https://www.share-huj.edu.sg/>



— 上海交通大学 —
新加坡研究生院
SJTU-APGI

Shanghai Jiao Tong University Asia-Pacific Graduate Institute (SJTU-APGI)

About "Carbon-Negative Synthetic Biology for Biomaterial Production from CO₂" (CNSB)-CREATE programme

CNSB programme focuses on developing carbon-negative solutions by converting CO₂ into high-value biomaterials, biofuels through synthetic biology and advanced photobioreactor technologies. Jointly led by SJTU and the NUS, the programme integrates expertise in synthetic biology, materials science, chemical engineering, artificial intelligence, and bioprocess engineering to create efficient light-driven microbial cell factories.

How does the project/innovation work?

CNSB combines four interconnected research tracks covering artificial enhancement of photosynthesis, biofoundry-enabled strain engineering, photobioreactor development, and downstream product conversion. The programme engineers cyanobacteria and other microbial chassis to directly utilise CO₂ as a carbon source, while the use of advanced photobioreactors, digital twin technologies, and AI-driven optimisation improve productivity and scalability. This integrated platform enables the conversion of captured carbon into valuable biomaterials and sustainable chemicals with reduced environmental impact.

What the project/innovation aims to achieve, or what is its impact on society/industry?

CNSB aims to accelerate the transition towards a low-carbon and circular bioeconomy by transforming CO₂ from a greenhouse gas into a valuable resource. The programme supports Singapore's decarbonisation agenda through the development of sustainable biomanufacturing technologies and next-generation bio-based products. Key achievements to date include engineering cyanobacterial strains capable of producing 2,3-butanediol directly from CO₂, successful deployment of a 50 L pilot-scale photobioreactor integrated with digital twin optimisation, and ongoing scale-up towards a 500 L system to support industrial translation. The programme also serves as a platform for training highly skilled researchers and strengthening international research collaborations in synthetic biology and decarbonisation.

About SJTU-APGI

The Shanghai Jiao Tong University Asia-Pacific Graduate Institute (SJTU-APGI) is SJTU's Singapore-based research and education institute and a key partner in Singapore's CREATE initiative. Through multidisciplinary programmes (E2S2 and CNSB), SJTU-APGI advances international research collaboration, technology innovation, and talent development in sustainability, environmental solutions, synthetic biology, and low-carbon technologies, supporting Singapore's transition towards a more sustainable future. For more information on SJTU-APGI's other projects, please visit: <https://sjtu-apgi.edu.sg/>



Singapore-MIT Alliance for Research and Technology

Singapore-MIT Alliance for Research and Technology (SMART)

About “Critical Analytics for Manufacturing Personalized-Medicine” (CAMP) programme

CAMP Interdisciplinary Research Group (IRG) focuses on better ways to produce living cells as medicine or cellular therapies to provide more patients access to promising and approved therapies. Leveraging deep collaborations within Singapore and MIT in the United States, CAMP invents and demonstrates Critical Quality Attributes (CQA) and Process Analytic Technologies (PAT) capabilities from stem to immune cells, and its work addresses ailments ranging from cancer to tissue degeneration, targeting adherent and suspended cells, with and without genetic engineering.

How does the project/innovation work?

One of the start-ups from CAMP, BioxCyte, addresses sepsis, the body’s extreme response to an infection, which is a life-threatening medical emergency and one of the most frequent causes of death worldwide. Early diagnosis is critical, yet current diagnostic methods can take up to 24 hours, delaying treatment and leading to increased mortality and inappropriate care. The system uses a disposable microfluidic cartridge and a compact analyser to assess immune cell behaviour from a finger-prick blood sample. Requiring just a drop of blood, the system uses an AI-powered software model to generate a sepsis risk score. Clinical studies have validated the system in emergency and intensive care settings, demonstrating its ability to stratify patients by inflammation and sepsis risk. This work sits alongside other CAMP efforts, including human induced pluripotent stem cell (hiPSC)-based research, which similarly leverages advanced cell analytics and microfluidic approaches to improve control and reliability.

What the project/innovation aims to achieve, or what is its impact on society/industry?

Bioxcyte aims to support faster triage and treatment decisions in emergency settings. Designed to complement existing laboratory methods, the system can deliver results in around 10 minutes (30 times faster than conventional tests) with over 92% accuracy, potentially enabling earlier intervention, reducing unnecessary antibiotic use, and easing pressure on emergency departments and intensive care units.

About SMART

Singapore-MIT Alliance for Research and Technology ([SMART](https://smart.mit.edu/)) is MIT’s Research Enterprise in Singapore, established by the Massachusetts Institute of Technology (MIT) in partnership with the National Research Foundation of Singapore (NRF) since 2007. SMART is the first entity in the Campus for Research Excellence and Technological Enterprise (CREATE) developed by NRF. SMART serves as an intellectual and innovation hub for research interactions between MIT and Singapore. Cutting-edge research projects in areas of interest to both Singapore and MIT are undertaken at SMART. SMART currently comprises an [Innovation Centre](#) and six Interdisciplinary Research Groups (IRGs): Antimicrobial Resistance ([AMR](#)), Critical Analytics for Manufacturing Personalized-Medicine ([CAMP](#)), Disruptive & Sustainable Technologies for Agricultural Precision ([DiSTAP](#)), Mens, Manus and Machina ([M3S](#)), Wafer-scale Integrated Sensing Devices based on Optoelectronic Metasurfaces ([WISDOM](#)), and Wearable Imaging for Transforming Elderly Care ([WITEC](#)). For more information on SMART and other projects, please visit: <https://smart.mit.edu/>

TUMCREATE

About “Optimizing environmental light exposure at scale to support eye and brain development and health across the Lifespan” (LightSPAN) programme

The LightSPAN programme focuses on understanding how light exposure influences human health, particularly vision, cognition, and overall well-being. The programme builds on scientific evidence that light plays a critical role not only in visual perception but also in regulating biological processes through specialised retinal cells. By bringing together clinical, research, and international collaborators, LightSPAN aims to study light exposure patterns across different populations and life stages, and to develop scalable strategies to optimise these exposures. The programme’s approach integrates ophthalmology, neuroscience, and public health perspectives to address issues such as eye development and broader health outcomes. Ultimately, LightSPAN seeks to generate evidence-based recommendations and interventions that can be applied in real-world settings, supporting healthier environments in homes, schools, and workplaces.

How does the project/innovation work?

LightSPAN combines the use of a mobile application and wearable sensing devices to measure and monitor individuals’ real-world light exposure. The project analyses how different patterns of light exposure influence sleep, mood, cognition, and overall well-being across target populations, particularly older adults and children. These data are integrated with clinical and behavioural insights to establish evidence-based relationships between light environments and health outcomes. The findings are subsequently translated into practical lighting strategies and recommendations for deployment in homes, schools, and care facilities.

What the project/innovation aims to achieve, or what is its impact on society/industry?

LightSPAN aims to improve sleep quality, cognitive performance, mood, and overall well-being through optimised lighting environments. By generating evidence-based guidance, the programme can inform the design of healthier built environments and lighting standards in residential, educational, and care settings. This is expected to contribute to improved quality of life, support healthy ageing, and enhance developmental outcomes in children.

About TUMCREATE

Founded in 2010, TUMCREATE is a multidisciplinary research platform fostering research exchanges between the Technical University of Munich (TUM) and the world’s leading universities, local institutions, and public agencies as well as industry partners from the region to contribute to the sustainable transformation of societies through science and technology. Funded by the National Research Foundation, TUMCREATE’s multi-faceted research projects span topics from urban mobility, food science and technology, biomedical technology, quantum security and preventive care to solutions for a carbon-neutral megacity. For more information on TUMCREATE and other projects, please visit: <https://www.tum-create.edu.sg/>