

## MEDIA RELEASE

### **Singapore Institute for Clinical Sciences Awarded with Wellcome Leap Funding to Study Early Childhood Brain Development and Function**

*Singapore studies form part of international consortium's research and will study brain structure, connectivity and executive function over the early years of life*

**Singapore, 8 October 2021** – An international consortium led by Professor Sir Peter Gluckman – Chief Scientific Officer at A\*STAR's Singapore Institute for Clinical Sciences (SICS), and Founding Director of The University of Auckland's Liggins Institute – has been awarded a multi-million-dollar, multi-year contract from a US-based global Advanced Research Projects Agency (ARPA) for health, Wellcome Leap, as part of its 1kD programme that's aimed at examining the factors that influence human brain development in early life and providing major breakthroughs to predict critical aspects of children's brain development.

Through studies of the development of self-regulation and executive function in the first three years of life, researchers from Singapore, New Zealand, the US, Bangladesh and Jamaica aim to develop accurate, scalable, early screening methods to predict problems of executive function and responses to intervention.

The Singapore research with Wellcome Leap is led by Professor Michael Meaney who is Director of the Translational Neuroscience programme at SICS and co-Director of the Brain – Body Initiative in A\*STAR. These studies will explore novel approaches for the study of brain structure, connectivity and function for screening over the first years of life. The studies include methods such as imaging brain connectivity and analysing brain wave patterns associated with the development of executive functions. A\*STAR's SICS research programmes seek to develop strategies to optimise executive function and cognitive function across development. Current activity includes educational as well as parental support interventions. This research also aims to eventually develop nutritional strategies through analyses of the gut microbiome and early brain development.

The Singapore team includes Dr Anne Rifkin-Graboi from the National Institute for Education and Dr Michelle Kee from SICS, as well as clinician-scientists Dr Tan Ai Peng, Dr Chan Shiao-Yng and Dr Evelyn Law from SICS and the NUS Yong Loo Lin School of Medicine.

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Overall, the consortium's research is focused on the development of executive functions, which refers to the ability of an individual to focus attention, process information, plan and organise activity, problem-solve and regulate emotional states. Executive functions are the best predictor of success in school and when developed from early life in a highly coordinated manner, will result in individual differences as early as three years of age.

Well-developed executive functions improve the quality of lifelong physical and mental health and underpin productivity and well-being. In contrast, poor executive function development has significant consequences for the individual and society. While executive functions develop early in life, these brain functions remain modifiable through intervention well into adulthood.

“As children approach their third birthday, their level of executive functioning will greatly contribute to how successful they will be in negotiating the opportunities and obstacles they face in life,” says Professor Gluckman.

Professor Richie Poulton from the University of Otago's Dunedin Multidisciplinary Health and Development Research Unit, Professor Justin O'Sullivan from The University of Auckland's Liggins Institute and Professor Sir Peter Gluckman will lead the New Zealand site. Professor Charles Nelson from Harvard University leads the research activity in the US, Jamaica and Bangladesh (together with Professor Terrence Forrester from The University of the West Indies and Dr Rashidul Haque from icddr,b).

The grand challenge is to identify children at risk for poor executive function development in the first 24 months of life when interventions are most effective – this approach is designed to diminish the risk of problems with early schooling and later mental health. With the goal of advancing health and human potential, the Singapore-based research lies at the forefront of this objective and will follow the development of children born to mothers participating in the Mapping Antenatal Maternal Stress (MAMS) project funded by SICS and based at the National University Hospital.

Wellcome Leap is a US-based global ARPA founded by the Wellcome Trust to accelerate innovations that benefit global health and deliver critical breakthroughs in health at speed and scale. It brings together multi-disciplinary, global teams to solve problems that will impact the health and well-being of children around the world.

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## **About the Singapore Institute for Clinical Sciences (SICS)**

Founded in 2007, the Singapore Institute for Clinical Sciences' (SICS) mission is to promote health and human capacity in Singapore, Asia and globally. The first institute within the Agency for Science, Technology and Research (A\*STAR) to focus on clinical sciences and translational research, SICS posits that health has its origins in good beginnings and continued interactions between our physiological makeup and environment. To fulfil our vision of building gateways and an evidence base for positive health, our institute strongly promotes clinical research that supports the understanding of metabolism, neuroscience and how they impact human development. To take our research into the real world, we launched seminal nationwide birth cohort studies such as Growing Up in Singapore Towards healthy Outcomes (GUSTO) and Singapore PREconception Study of long-Term maternal and child Outcomes (S-PRESTO). By paving the way for scientific research to make a difference to the social and economic fabric of our communities, we are committed to 'Changing Tomorrow's Health, Today'.

## **About the Agency for Science, Technology and Research (A\*STAR)**

The Agency for Science, Technology and Research (A\*STAR) is Singapore's lead public sector R&D agency. Through open innovation, we collaborate with our partners in both the public and private sectors to benefit the economy and society. As a Science and Technology Organisation, A\*STAR bridges the gap between academia and industry. Our research creates economic growth and jobs for Singapore, and enhances lives by improving societal outcomes in healthcare, urban living, and sustainability. A\*STAR plays a key role in nurturing scientific talent and leaders for the wider research community and industry. A\*STAR's R&D activities span biomedical sciences to physical sciences and engineering, with research entities primarily located in Biopolis and Fusionopolis. For ongoing news, visit [www.a-star.edu.sg](http://www.a-star.edu.sg).

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