



Agency for
Science, Technology
and Research

CREATING GROWTH, ENHANCING LIVES



Moonshot International Symposium

Dr Danny SOON

Executive Director

Biomedical Research Council (BMRC)

Agency for Science, Technology & Research (A*STAR), Singapore

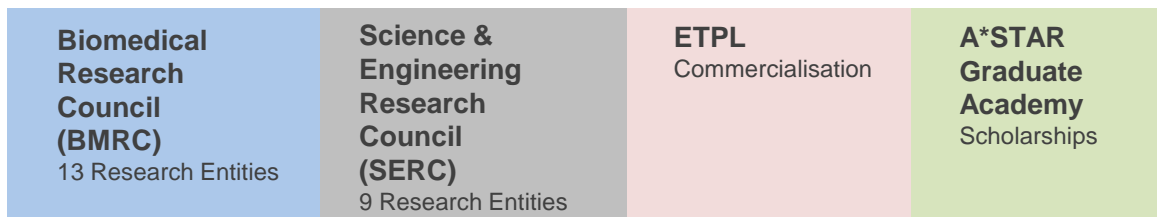
Our Mission and Vision

MISSION

We advance science and develop innovative technology to further economic growth and improve lives

VISION

A global leader in science, technology and open innovation



**>5,200
STAFF**

>4,100

Researchers, Engineers
and Technical Support
Staff

40%

of whom come
from 64 countries

Singapore Research Framework 2016-2020



Challenges beyond 2020

Food Security



Climate change

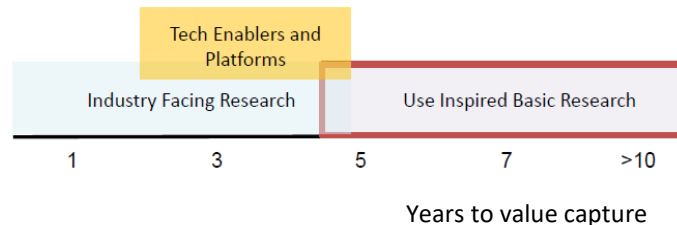


Circular economy

Ageing population



Long term R&D strategies



The Global Ageing Population Phenomenon

Accelerating Ageing Population in Asia Drives Healthcare Demand



Source: Extracted from United Nations Population Division, World Population Prospectus 2019. Data accessed on 21 Oct 2019.

Singapore: **1 in 4** above 65 years old by 2030

Active and Confident Ageing – Three Key Thrusts

1. Lengthening of health span

Delay onset of disease and disability



Phase 1 – Short term Health Span

- Monitoring
- Analytics
- Population insights
- Behavioural e.g. treatment adherence and compliance

2. Productive longevity

Enable learning and re-learning → Ageless work places



Phase 2 – Mid term Rehabilitation Mental health

- Stroke
- Performance
- Mental wellness
- Cognitive health

3. Ageing-in-place

Live independent and autonomous lives despite physical frailty



Phase 3 – Long term Musculoskeletal

- Sarcopenia
- Osteoarthritis

GUSTO is Singapore's largest and most comprehensive birth cohort study

To study if mothers' diet and lifestyle during pregnancy affect their babies' growth after birth, with extended follow up into childhood

THE STRAITS TIMES

HOME | B17

One in 5 mums-to-be may develop diabetes

Higher risk of complications for such women and their kids: Study

By GRACE CHUA

ONE IN five expectant mothers here could be suffering from diabetes during pregnancy – and some might not even know it.

The temporary condition, called gestational diabetes, where the body cannot process glucose efficiently during pregnancy, puts women and their children at higher risk of complications and of developing full-blown Type II diabetes later in life.

Researchers here were working on the Gusto (Growing Up In Singapore Towards Healthy Outcomes) study, part of a major research into low metabolic diseases arise from early life.

The study follows some 1,200 expectant mothers and their children throughout pregnancy, birth and the early years of life.

The Gusto researchers tested all the mothers for diabetes, and found that in the Malay mothers, the occurrence of gestational diabetes was 12 per cent; for Chinese, 20 per cent; and for Indians, 22 per cent. None of the women had diabetes at the start of their pregnancies, and some had no symptoms.

"It's certainly one thing we didn't expect," said the principal investigator, Associate Professor Chong Yap-Seng of the Yong Loo Lin School of Medicine. Gestational diabetes is thought



Madam Linda, 40, seen here with her 2½-year-old son Muhammad Syamir Amir, had gestational diabetes in all four of her pregnancies. ST PHOTO: AZIZ HUSSIN

to occur in about 5 per cent to 10 per cent of pregnancies in Singapore. Here, women are tested for the condition if they have risk factors like obesity or a family history of diabetes.

Prof Chong cautioned that the study's findings might not be representative of the wider Singapore population. One goal of the Gusto study is to compare ethnic groups, so it had a higher proportion of Malay and Indian mothers than the general population. He said it is unclear whether gestational diabetes is on the rise, or is now just detected more often.

"If the sample rates do apply in general, Prof Chong suggested, expectant mothers here could be routinely screened for gestational diabetes with a pair of blood tests for \$20. And those who do have

the condition should be followed up long-term by general practitioners, he added.

Mrs Sujana Challa, 28, is one mother whose gestational diabetes was detected only during the Gusto study. Now, she has an annual blood test to check for signs of diabetes. Another mother in the study, Madam Linda Hussain, 40, has had gestational diabetes in all four of her pregnancies.

"I had to be more careful in my diet, count my calories, and take a bit of exercise after food," said Madam Linda. In her first pregnancy 18 years ago, she did not take the doctor's caution seriously, she said, and her daughter suffered from low blood sugar at birth. But the other three, aged 2½ to 16, were born healthy.

|| carol@sp.com.sg

<https://www.gusto.sg/one-in-5-mums-to-be-may-develop-diabetes/>

PUNCH LINES

NEWS ITEM

Anxious mums = smaller babies

Study finds that the mental state of pregnant women can affect their infants' brain development

Scientists from the Agency for Science, Technology and Research (A*STAR) Institute for Clinical Studies have said more towards to mental, but the findings suggest that looking after expectant women is vital for ensuring their children get the best start in life. "To really help our children, we need to take care of women in the months and years before they are born."

Children tend to have higher IQs when they are born longer, heavier or with larger head circumferences.

Since anxious mums give birth to smaller babies, I am keeping my wife as stress-free as possible.

Does a baby with a bigger head lead to a more painful birth...?

AHHH!

<https://www.gusto.sg/anxious-mothers-smaller-babies/>

A*STAR tech – Human Augmentation & Neuro-modulation

Brain-Computer Interface (BCI) Rehabilitation for Stroke

Needs

- Stroke: leading cause of disabilities. Rehabilitation is labour intensive, expensive, lack of repeatability and objective measures

Technology

- Neurorehab trains the brain and limb

Advantages

- Induces activity-dependent brain plasticity in motor cortex

Clinical validation

- Completed 3 trials on chronic stroke
- Statistically & clinically significant improvement in patients with chronic stroke





Agency for
Science, Technology
and Research

CREATING GROWTH, ENHANCING LIVES

Thank you

