



News Release

Singapore – 1 November 2018

For immediate reporting

**Call for Research Proposals: Temasek Foundation Innovates launches  
9<sup>th</sup> Grant Call with a new interest in clinical trials**

Temasek Foundation Innovates launches its 9<sup>th</sup> call for proposals today, as part of the Singapore Millennium Foundation Research Grant Programme. The research areas supported centre on three key themes: **Learn Well** (e.g. studies on learning and pedagogy), **Live Well** (e.g. studies on food supply and resiliency and biomimetics) and **Leave Well** (e.g. studies on palliative care and good end-of-life).

2. This year, the Foundation has identified specific interest areas within each theme, to address emerging needs and challenges in our local community.

- a. Clinical trials for affordable and accessible treatments, which may find less commercial support.
- b. Interest areas under each theme:
  - i. **Learn Well** – Effective Language Acquisition in Early Childhood, and Dealing with Learning Difficulties
  - ii. **Live Well** – Healthy Food, Healthy Earth
  - iii. **Leave Well** – Palliative Care on the Dementia Continuum, and Palliative Care in Pediatric and Young Adult Populations

3. Professor Leo Tan, Chairman of Temasek Foundation Innovates, said: *“Through our support for innovative, practical and sustainable research solutions, our goal is to create a better life for everyone in Singapore. This year, we have introduced a new category for clinical trials for low cost and readily available treatments. Wound management, for example, can be costly. Affordable and less burdensome treatment options can enhance one’s recovery process. In addition, we have identified specific interest areas under our existing themes that have greater applicability to Singapore society. We look forward to receiving proposals from the research community, on how we can collectively tackle these areas.”*

4. Shortlisted projects will be funded up to a total amount of \$750,000 for a maximum period of three years. A booster grant to support an additional year of work at \$250,000 is also available, if the research can find a partner that can help bring the project closer to deployment.

5. The due date for submitting proposals is **31 January 2019**. For complete guidelines and eligibility requirements, along with information regarding the application process, please visit [www.temasekfoundation-innovates.org.sg](http://www.temasekfoundation-innovates.org.sg).

6. Some 49 projects have been funded since the first grant call in 2011. Projects funded from the most recent 8<sup>th</sup> grant call include exploring how a horse-assisted learning programme can improve resilience among youths at risk; developing an online platform that allows parents of young children suffering from terminal illnesses to reflect on their experiences and emotions, and cope with grief; and assessing the threat of foodborne pathogens to the safety of our food supply. Please see **ANNEX** for full details of the eight projects funded under the 8<sup>th</sup> Grant call which closed earlier this year.

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## **About Temasek Foundation Innovates**

Temasek Foundation Innovates is a Singapore-based non-profit philanthropic organisation that funds and supports programmes focusing on developing practical solutions for a better life through research and development. Established in 2016, it aims to strengthen research capabilities by nurturing talents, as well as encouraging cross collaborations.

The Foundation manages the Singapore Millennium Foundation Research Grant Programme, under which competitive grant calls have taken place annually since 2011. The Foundation also supports the Temasek Life Sciences Laboratory.

Temasek Foundation Innovates and the other Temasek Foundations were established by Temasek to better serve the evolving needs of the wider community, reinforcing its approach to sustainable giving. Since its inception in 1974, Temasek has established 19 endowments, which focus on building people, building communities, building capabilities and rebuilding lives.

For more information on the Temasek family of Foundations, please visit [www.temasekfoundation.org.sg](http://www.temasekfoundation.org.sg).

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**PROJECTS AWARDED UNDER 8<sup>TH</sup> GRANT CALL**

**1. Mindset interventions to nurture strategic, self-regulated learners**

**Principal Investigator:**

Dr Patricia Chen  
Faculty of Arts and Social Sciences  
National University of Singapore

**Collaborators:**

Agency for Science, Technology and  
Research; Stanford University

**Research Summary:**

In today's world where learning resources are more readily available, the onus is on the individual to be able to manage his or her own learning effectively. Practising self-regulated learning includes planning one's studying, generating and applying learning strategies, self-monitoring the learning process, changing strategies when necessary, and reflecting on one's performance.

This research project aims to design interventions to help learners develop the mindset and capacity to manage their own learning, focusing on two key groups:

- 1) Tertiary learners, many of whom have to cope with less structure and more self-direction as they progress to post-secondary education and later into the workforce
- 2) Pre-schoolers aged 6 to 7 years old, who are starting to develop the cognitive capacity to think strategically for themselves

The effectiveness of these interventions will be tested using randomized, controlled experiments in the laboratory and in classrooms.

## 2. Equine-assisted learning on social cognition of at-risk youths

**Principal Investigator:**

Dr Ho New Fei  
Research Division  
Institute of Mental Health

**Co-PIs and Collaborators:**

Institute of Mental Health; EQUAL-ARK

**Research Summary:**

There are many reasons why youths may not do well in our mainstream curriculum. Evidence has shown that these youths have a higher risk of not being able to sustain future employment and/or commit criminal offences. As such, seeking alternative avenues of instilling in these youths lifelong competencies, beyond just academic that will ensure their success in life, is critical.

Community-based interventions are a sustainable way to boost skills required for at-risk youths to develop life-long competencies. Rigorous evidence on the benefits of horse-related learning interventions on at-risk youths is lacking.

Hence, the research team will study the effects of a horse-assisted learning programme conducted by a local non-profit organization, EQUAL-ARK, which reaches out to 500 beneficiaries yearly from specialized schools. The team will adopt a neuroscience approach to

- 1) Determine whether horse-assisted learning improves resilience and emotional functioning in at-risk youths; and
- 2) Determine whether improvements in horse-related learning leads to better academic performances and classroom behaviours.

### 3. Survival expectations and hope among cancer patients at end-of-life

**Principal Investigator:**

Prof Eric Andrew Finkelstein  
Lien Centre for Palliative Care  
Duke-NUS Medical School

**Co-PIs:**

Duke-NUS Medical School; National  
Cancer Centre Singapore; Singapore  
General Hospital

**Research Summary:**

Many international studies report that advanced cancer patients are overly optimistic about their prognosis. This is also true in Singapore. Findings from the research team's ongoing study called "Costs and Medical Care of Patients with Advanced Serious Illness in Singapore", also funded by Temasek Foundation Innovates, show that one third of advanced cancer patients believed that their current treatments would cure them and roughly half expected to survive for more than 5 years.

The team hypothesizes that the disconnect between patient-reported prognosis and actual survival data results arise because many patients are reporting not what they believe, but what they would like to believe. This study aims to test this hypothesis (i.e. to discern patient's beliefs about prognosis independent of hope). The team also aims to identify factors that influence patient's beliefs and how doctor-patient communication can be tailored based on patients' preferences for prognostic information.

The team will be surveying cancer patients with a prognosis of less than one year, nested within a randomized controlled trial. Overall, this study aims to address and improve decision making at the end life – an important component of quality palliative care.

#### 4. Adaptation and pilot testing of the ENABLE (Educate, Nurture, Advise, Before Life Ends) intervention

**Principal Investigator:**

Dr Grace Yang  
Palliative Medicine  
National Cancer Centre, Singapore

**Co-PIs and Collaborators:**

National Cancer Centre Singapore; Khoo Teck Puat Hospital; Tan Tock Seng Hospital; Duke-NUS Medical School; The University of Alabama at Birmingham

**Research Summary:**

ENABLE is a nurse-led programme that provides supportive care to patients with serious illnesses and their family caregivers. For instance, a nurse would meet with patients to help them match resources to their needs, as well as conduct training in problem-solving skills to reduce distress and help them make decisions on issues such as symptom management. ENABLE has shown to improve patient outcomes in the American context e.g. better quality of life, less depressed mood and longer survival. The ENABLE sessions, originally conducted by advanced practice nurses, now have the potential for delivery by registered nurses. It is therefore scalable and feasible for widespread implementation.

This study aims to adapt and pilot test the ENABLE programme in Singapore. The research team will interview healthcare professionals, advanced cancer patients and caregivers, to get their views on the relevance of topics covered in the ENABLE programme and other topics that may be useful to include. The team will consult a multi-disciplinary advisory group on the interview results, as well as ways the ENABLE content can be adapted for cancer patients in Singapore. The adapted ENABLE-SG programme will then be piloted among advanced cancer patients and their caregivers across Khoo Teck Puat Hospital, National Cancer Centre and Tan Tock Seng Hospital. The ENABLE-SG programme may be also adapted for other serious illnesses such as heart failure.

## 5. Development and evaluation of a Narrative E-Writing Intervention (NeW-I) for parents of children with life-limiting illness

### **Principal Investigator:**

Dr Andy Ho  
School of Social Sciences  
Nanyang Technological University

### **Co-PIs and Collaborators:**

Nanyang Technological University; KK  
Women's and Children's Hospital; Club  
Rainbow Singapore

### **Research Summary:**

Conventional grief support interventions for parents whose children are terminally ill often begin only after the child's death. Despite robust evidence showing that pre-loss interventions can help parents better cope with grief, there is no known programme in Singapore designed to address the psycho-emotional-spiritual needs of these parents.

Research has found that the narrative approach helps individuals get in touch with emotions that are challenging to accept and generate new meaningful stories about life. The research team has thus developed the Narrative e-Writing Intervention (NeW-I) for parents anticipating the death of their child. As most parents may not have the time to engage in sit-and-talk therapy, the NeW-I is a therapist-facilitated online platform that allows greater reflection of experiences and emotions.

A randomized control trial with a built-in qualitative evaluation and feasibility study will assess the effectiveness of the NeW-I. The NeW-I will be piloted across Singapore, in collaboration with KK Women's and Children's Hospital and Club Rainbow Singapore. The NeW-I aspires to improve quality of life and emotional well-being of parents facing the terminal illness and eventual death of their sick child. The research findings will serve to inform and enhance holistic pediatric palliative care locally and internationally.

## 6. Assessing the threat of a previously unknown foodborne pathogen (Group B *Streptococcus*) to the safety and resiliency of the food supply in Singapore

### Principal Investigators:

Dr Timothy Barkham

Department of Lab Medicine

Tan Tock Seng Hospital, Singapore

Dr Swaine Chen

Department of Medicine

National University of Singapore

### Research Summary:

In 2015, a large human outbreak of *Streptococcus agalactiae* (GBS) occurred in Singapore, due to a single clone of GBS, sequence type ST283. Investigations into the outbreak led to new policies including banning the use of freshwater fish in ready-to-eat dishes, and requiring procurement of saltwater fish for raw consumption from AVA-approved suppliers. ST283 is now almost unseen in Singapore. However, other GBS strains (non-ST283) continue to cause human infections in Singapore (with about 230 invasive cases/year in adults), similar to other countries globally.

The research team hypothesizes that other GBS strains do cause foodborne disease in humans, and therefore GBS isolated from infected humans will be nearly identical to those found in food. The research team seeks to compare GBS isolated from humans with GBS isolated from food by whole genome sequencing, a strategy that successfully established the foodborne transmission of ST283. In doing so, the team will sample food types commonly consumed by the public, and collect human GBS isolates from selected hospital laboratories across Singapore.

If other strains of GBS are found to be foodborne, this could provide further knowledge on GBS in turn enhancing regulatory policies and surveillance tools to ensure the resiliency of Singapore's food supply.

## 7. Innovative system for rejuvenation of soil and plant ecosystem in urban indoor farming systems

### **Principal Investigator:**

Dr Mandar Godge  
School of Applied Science  
Temasek Polytechnic

### **Co-PIs and Collaborators:**

Temasek Polytechnic; National University of Singapore; Agri-Food and Veterinary Authority of Singapore; Farm Delight Pte Ltd; Urban Growing Solutions Pte Ltd; Arianetech Pte Ltd

### **Research Summary:**

Introduction of innovative agriculture methods for increasing the world food production would increase ecosystem stability and promote a more sustainable environment.

This project adopts a combination of light-emitting diode (LED) lights, mycorrhizal fungi (AMFs), plant hormones and accumulation of flavonols, which enhances the yield parameters in fruit vegetables and its nutritional status, as well as rejuvenates the soil ecosystem. Light has visible effects on the metabolic activity of fungi, bacteria and plants. This research aims to enhance the rejuvenation of soil using specific fungal species thereby rendering them usable for multiple planting seasons, which is a major limiting step for the urban farmers.

The novel area the project explores is the use of LED lights with specific wavelengths for combinatorial photo-activation of AMFs, the fruit vegetables, leafy vegetables and soil ecosystem. This robust system would promote cultivation of fruit and leafy vegetables of economic importance for urban farming. The system will be test bedded by Agri-Food and Veterinary Authority of Singapore and commercial partners.

## 8. A novel recycle aquaculture system for high efficiency nitrogenous waste elimination

### **Principal Investigator:**

Dr Huang Zhi  
School of Applied Science  
Temasek Polytechnic

### **Co-PIs and Collaborators:**

Temasek Polytechnic; Blue Aqua  
International Pte Ltd

### **Research Summary:**

Over the decades, aquaculture is maturing more rapidly than any other animal food-producing sectors. Recirculating aquaculture system (RAS) technology promises to be effective and can provide sustainable farming. The core, removal of ammonia waste in RAS is managed by biofiltration to convert ammonia to nitrate by nitrification. Moving Bed Bioreactor (MBBR) is the most popular commercial biofiltration process.

This project aims to develop an integrated solution for ammonia waste elimination in both freshwater and saltwater RAS by the combination of nitrification and Anaerobic Ammonium Oxidation (Anammox) processes. First, to overcome the shortage of MBBR, low filling rate and biofilm detachment, a novel Spinning Bed Bioreactor (SBBR) will be developed to achieve high-efficiency nitrification. Second, an Anaerobic Ammonium Oxidation Chamber (Anammox Chamber) will also be devised to minimize the accumulation of nitrate in RAS.

The research team will be collaborating with Blue Aqua International Pte Ltd in providing technical input, well as assess its suitability for commercialization.