

Feed. Fuel.

Feel Better.

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About

Temasek Life Sciences Laboratory, a research institute established in 2002, has about 180 researchers from 20 different nationalities.

Vision

Our vision is to build a preeminent organisation of global talent to undertake bio-molecular science research and applications to benefit people in Asia and beyond.

Mission

To harness the power of the life sciences to improve lives.

Charter

TLL is a beneficiary of Temasek Trust and is an institution with a reputation of integrity and excellence.

- It offers research funding for programmes in line with its strategic focus, and welcomes complementary funding from other sources as a market test of research ideas.
- It values integrity and excellence and expects the new knowledge and its application to contribute to the well-being of mankind.

TLL is a developer of people to deliver breakthrough science and impactful application.

- It attracts established and young researchers, trains and mentors budding scientists as well as establishes a network of alumni and other scientific and industrial collaborators to achieve breakthrough science and impactful applications.
- It supports, nurtures and challenges our people to be leaders in their fields of science and technology.

TLL is an organisation of people who strive to strengthen it to benefit society and the economy.

- It motivates and incentivises its people to continuously strengthen the organisation as they build up their own credentials.
- It encourages collaborations and partnerships with fellow researchers in basic and applied research to multiply its capabilities to contribute through its research and application to society and economy especially in Asia.

We focus on:

Food Security:

Our focus on genetics and biotechnology platforms forms the foundation for improving overall availability of sustainable food and nutrition for growing urban populations

Sustainability:

Biological tools in Industrial & Synthetic Biology accelerates development of platform technologies for bio-based circular economy

Well-Being:

Human & Veterinary Sciences bring multipronged approaches to extend human health spans, alleviating issues related to infectious diseases and ageing

Chairman's message

The challenges that we face today are complex, not least because of the dynamic nature of their inter-dependencies and inter-connectedness. The obvious interconnection between climate change and food security for instance is illustrative of this. Importantly, it will demand innovative and collaborative solutions grown and harvested from across many disciplines and knowledge fields. This integrated multi-disciplinary and multi-party approach is imperative if we are to make meaningful headway to deal effectively with the kind of challenges that we as a global community face and have to grapple with.

So apart from the core research work driven by our PIs across our focal areas of food security, sustainability and well-being, TLL has in the past year been very active in its external engagement with academia, research, industry, government and philanthropic entities in and beyond Singapore. This search for and pursuit of collaborative partnerships and

exchange is not only crucial to finding and co-finding useful knowledge and good solutions to address pressing complex challenges TLL work is focused on, it is also key to enable such ideas, innovations and solutions to be translated, operationalised and amplified for the practical benefit of people, communities and the common good.

What we aspire to develop in time is a cohesive network of partner organisations, fellow researchers and individuals. In the case of the latter, we have indeed been fortunate to have benefitted from the contributions of so many individuals who collectively compose a rich and diverse alumni grown over TLL's 20 year history. The latest members of this alumni include Mr Teo Ming Kian, Dr Soo Khee Chee and Mr Tan Suan Swee who retired from the Board over the last year. Their leadership, guidance, passion and support for TLL – its mission and its people- over more than a decade have left an enduring mark and are truly and deeply appreciated.

Joining the TLL family are our new board members, Mr Kenneth Er, Prof Hong Wanjin, Mr Niam Chiang Meng, and Prof Leo Tan. We look forward to working with them and know that their deep professional knowledge and rich career experience will help TLL realise and advance in its mission to harness the power of life sciences to do good.

“TLL has in the past year been very active in its external engagement with academia, research, industry, government and philanthropic entities in and beyond Singapore.”



MR BENNY LIM

Chairman

CEO's message

This year has been one of remarkable progress and collaboration. Our institute has forged new paths, built strong partnerships, and made significant strides toward our shared vision of creating a better future through innovation and research — focusing on the convergence of Food Security, Sustainability and Well-Being, to enhance our contributions to the community.

As part of the Temasek Trust ecosystem, TLL has been able to deepen our collaborative efforts and expand our reach. A notable example is TLL's participation in the Philanthropic Asia Summit, which provided a

Platform for Action to showcase our Decarbonising Rice project. This enabled us to secure key funding to support the project's second phase to scale and initiate regional field trial to develop robust and localised emissions reduction methodologies through larger scale and multi-regional data collection. We were also honoured to have hosted the President of Global Policy & Advocacy from Bill & Melinda Gates Foundation.

Meanwhile, our Decarbonising Rice project has made good progress. Through collaborations with partners such as the Institute Teknologi Bandung and Rize in Indonesia, and the National Agriculture and Forestry Research Institute in Laos, we are laying the groundwork for sustainable innovations that will not only feed populations more sustainably but also contribute to the global fight against climate change. The support we have received, both through these partnerships and funding, will empower us to pioneer innovative solutions with a lasting environmental impact.

In addition, our role as a knowledge partner for the World Economic Forum's First Movers Coalition for Food further highlights our commitment to advancing research. Recognising the

pivotal role of food systems in achieving the Paris Agreement and limiting global warming to below 1.5°C, TLL is proud to contribute to this collective effort led by the World Economic Forum. By leveraging our knowledge and resources, we aim to make a significant impact on fostering sustainable practices within food systems.

We are also thrilled about Aqualita's collaboration with Tampines Town Council on Singapore's first urban container fish farm. Aqualita is a spin-off company from TLL and this initiative is pioneering urban aquaculture, integrating sustainable fish farming into community settings. This project not only reduces the carbon footprint of food production but also ensures a fresh supply of fish for local consumption, exemplifying our dedication to sustainable food solutions.

In the area of Maternal and Child Health, our research continues to make a difference. We are collaborating with the Bia-Echo Asia Centre for Reproductive Longevity and Equality (ACRLE) to understand ovarian aging and its implications for women's health. Our work on improving maternal-child health through the study of human breast milk underscores our commitment to enhancing the well-being of women and children.

Through these collaboration and partnerships, TLL received S\$12M worth of grant income, the highest to date.

This year has also been pivotal for Temasek Life Sciences Accelerator (TLA). A new joint venture was signed between TLA and Ocean Passion Ltd (OPL) (Legend Capital's (LC) Hong Kong-based SPV). This strategic partnership will provide both TLL and TLA access to strong research resources, incubation and translation experiences to broaden cross-institution collaboration opportunities and also access to early-stage investment networks to accelerate the growth of TLL's and TLA's portfolio companies.

Internally, TLL has continued to publish well in high impact journals including in the Proceedings of the National Academy of Sciences (PNAS), Nature Communications and Nature Reviews Molecular Cell Biology.

We have also seen a growth in our community of young researchers. The number of interns, PhDs, and Post-Docs has increased, underscoring TLL's role as a nurturing ground for the next generation of scientific talent.

As we look to the future, the partnerships we've cultivated will continue to be the cornerstone of our success. Our ongoing collaborations will drive our efforts to advance scientific research and innovation, addressing the pressing challenges of our time and creating tangible benefits for communities around the world.

Thank you for your continued support.

Financial Performance

During the year, TLL received S\$25 million in donations from the STEM endowment of Temasek Trust, which is aimed at the advancement of science, technology, engineering and mathematics. Temasek Trust is a steward of philanthropic assets, advocate of sustainability, and catalyst of positive impact.

For specific research programmes, TLL relies on grants from various public and private sector entities. Total grants secured during the year amounted to S\$2.8 million to be deployed over the next three years.

TLL has also developed additional sources of funding, including licensing our intellectual property (IP) as well as offering research and support services to the life sciences ecosystem in Singapore. TLL earned more than S\$1.8 million from these sources during the year. These efforts will allow us to continue to engage ecosystem players and stay abreast with developing trends in the sector.

Despite rising costs, TLL ended the year with an operating surplus of S\$0.9 million reflecting the fiscal prudence exercised in the management of TLL's activities and operations. We remain committed to sustainably growing our strong research capabilities.



MR PETER CHIA

Chief Executive Officer

Board of Directors



MR BENNY LIM

Chairman
(since Aug 2022)
(Chairman, Housing & Development Board)



MR PETER CHIA

Director
(since Aug 2017)
and Chief Executive Officer



MR RICHARD DEE

Director
(since Sep 2012)
(Board Director and Senior Vice President, UNILAB, Inc. and Affiliates)



MR KENNETH ER

Director
(since 1 Jun 2024)
(Deputy Secretary (Planning), Ministry of National Development)



DR GEH MIN

Director
(since Sep 2021)
(Director of World Wide Fund for Nature (Singapore) and Birdlife International (Asia))



PROF HONG WANJIN

Director
(since Jan 2024)
*(Chief Business Development Officer (Biomedical Research Council) and Professor & Research Director (Institute of Molecular and Cell Biology), A*STAR)*



MRS LEE AI MING

Director
(since Feb 2020)
(Senior Consultant, Dentons Rodyk & Davidson LLP)



PROF LIM KAH LEONG

Director
(since Apr 2023)
(Associate Vice President (Biomedical & Life Sciences), President's Office, and Professor & President's Chair in Translational Neuroscience, Lee Kong Chian School of Medicine)



MR NIAM CHIANG MENG

Director
(since Mar 2024)
(Chairman, Maritime and Port Authority of Singapore)



MR QUEK SEE TIAT

Director
(since 1 Dec 2022)
(Chairman, Accounting Standards Committee, ACRA)



PROF LEO TAN

Director
(since Jan 2024)
(Professor Emeritus, NUS)



PROF YU HAO

Director
(since Jan 2015)
(Provost's Chair Professor and Head of Department of Biological Sciences, NUS)

Research Groups

Cell Biology



GEORGE AUGUSTINE, PH.D

Temasek Senior Investigator (Molecular basis of neurotransmitter release from neurons, Optogenetic mapping of brain circuitry, Changes in brain circuitry occurring in dementia and schizophrenia)



GREGORY JEDD, PH.D

Senior Principal Investigator (Cell Biology, Fungal Biotechnology)



ZHANG DAN, PH.D

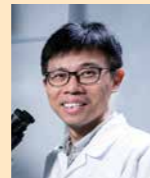
Principal Investigator (Cell Biology, Fungal pathogen, Yeast synthetic biology)

Developmental Biology



YU HAO, PH.D

Temasek Senior Investigator (Functional genomics, Plant reproductive development, Phytohormone signaling, RNA biology, Urban farming and Crop Biotechnology)



CAI YU, PH.D

Senior Principal Investigator (Insect Development, Genetics, and reproduction (Aedes aegypti and Drosophila melanogaster), Infectious Diseases and Vector Biology, Wolbachia-insect interactions)



ONG CHIN TONG, PH.D

Senior Principal Investigator (Developmental Biology, Neurodegenerative Disease, Genetics & Genomics)



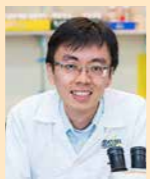
DAISUKE URANO, PH.D

Senior Principal Investigator (Computational Biology, Precision Agriculture, Plant Bio- and Nano-technology)



YU FENGWEI, PH.D

Senior Principal Investigator (Neuronal Development, Neuronal Pruning, Neurodevelopmental Disorders, Neurodegenerative Diseases, Developmental Genetics)



PEK JUN WEI, PH.D

Principal Investigator (Developmental Biology, Genetics & Genomics, Reproductive Biology & Transgenerational Inheritance)



SHEN LISHA, PH.D

Principal Investigator (Developmental Biology, Genetics & Genomics, Crop Biotechnology)

Molecular Pathogenesis



CHUA NAM HAI, PH.D

Temasek Senior Investigator (Emeritus) (Molecular Pathogenesis, Plant Biology)



NAWEED NAQVI, PH.D

Temasek Senior Investigator (Molecular Pathogenesis, Plant Biology, Agro-technology)



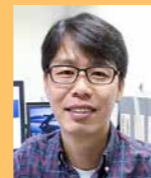
IAN CHEONG, PH.D

Senior Principal Investigator (Molecular Pathogenesis, Genetics & Genomics, Cancer Therapeutics)



YIN ZHONG CHAO, PH.D

Senior Principal Investigator (Molecular Pathogenesis in Rice, Plant Molecular Genetics, Marker-assisted breeding in rice and tomato, Plant Genetic Engineering)



PARK BONG SOO, PH.D

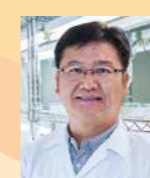
Principal Investigator (Plant Molecular Biology, Crop Biotechnology)



MOOKKAN PRABAKARAN, PH.D

Principal Investigator (Virus-host interactions, Emerging viruses, Vaccines and Antiviral therapies, Aquatic animal health)

Genome & Ecological Biology



JANG IN-CHEOL, PH.D

Senior Principal Investigator (Agronomy, Synthetic Biology, Genetics & Genomics)



JI LIANG HUI, PH.D

Senior Principal Investigator (Synthetic Biology and Metabolic Engineering, Utilization of Biomass, Microbial Resource and CO₂, Future Food)



SAROJAM RAJANI, PH.D

Senior Principal Investigator (Agronomy, Synthetic Biology, Genetics & Genomics)



RAMACHANDRAN SRINIVASAN, PH.D

Senior Principal Investigator (Agronomy, Ecological Biology, Genetics & Genomics)



YUE GEN HUA, PH.D

Senior Principal Investigator (Aquaculture Breeding, Plant Breeding, Genetics, Genomics and Aquatic Toxicology)



JIANG DANHUA, PH.D

Principal Investigator (Epigenetics, Plant environmental response and adaptation, Crop functional genomics and breeding)



RICHARD LE BOUCHER, PH.D

Principal Investigator & Director, Commercial Strategy (Aqua) (Tropical Aquaculture, Ecological Biology, Genetics & Genomics)



HENNING SEEDORF, PH.D

Principal Investigator (Genome & Ecological Biology, Genetics & Genomics, Gut Microbiome)



SOMIKA BHATNAGAR, PH.D

Head, Plant Transformation & Tissue Culture (Agronomy, Ecological Biology, Genetics & Genomics)

TLL has more than 180 researchers from about 20 different nationalities. They are led by research group leaders who carry out research activities in areas of their respective specialisations.

Want to know more about our researchers and their work, visit our website at <https://www.tll.org.sg/research/research-group-leaders/>.

Key highlights



\$S\$12M

worth of grant income



Contributed
60

scientific papers in international peer-reviewed journals



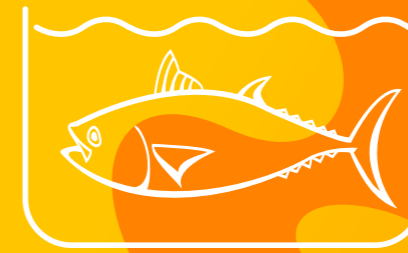
Made
7

scientific discoveries



168

Intern/ PhD students and Postdocs trained.



TLL programmes and activities aim to drive impact through:



Community Engagement



Supporting Singapore's Life Sciences Ecosystem



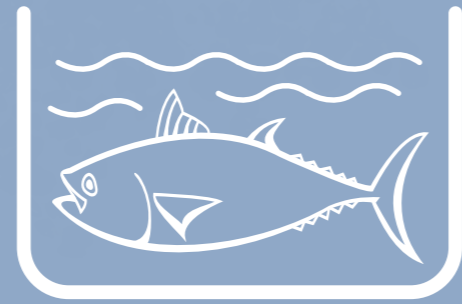
Advancing Scientific Standing



We continue to focus our research on Food Security, Sustainability and Well-Being, enabling the community to "Feed, Fuel and Feel Better".

Community Engagement

Urban Fish Farm in a Container - a Singapore's First



The supply and availability of wholesome seafood for consumers in urban cities could be affected by urbanisation, changing diets, population growth, and production challenges brought about by pollution, diseases and climate change.



Interventions

Leveraging on more than 20 years of research and innovation experience in fish genetics and behaviour, nutrition optimisation, water quality and disease management, in concert with advancements in fluid dynamics, remote sensing and IoT technology, a comprehensive urban recirculating aquaculture solution (RAS) is developed.

Our Fish Storey had aggregated and miniaturised the RAS into modularised, scalable and stackable mini-farms. These can be easily put together within a short time to meet short and long-term market demand.

Taking up a small footprint in urban cities, it is:

- Modular and Robust – its patented turnkey and modular design facilitates faster construction and deployment.
- Scalable and Versatile – the containers are stackable and integrated according to different needs.
- Consumes low energy and water consumption level, in turn incurring lower carbon footprint – utilises computational fluid dynamics and mathematical modelling to optimised water flow and waste removal efficiency.
- Reduced manpower cost – Utilises remote access and control system which enables reduced manpower required onsite.

RAS provides a cleaner and more controlled environment. It allows for the upcycling of fish waste, eliminating the need for antibiotics and reducing pollution caused by uneaten feed.

Unlike sea cages, the fish will be grown in conditions away from potential algae bloom, potential changes in water quality and enable farmers to be more certain about the amount of fish they can farm.

Partnering with Tampines Town Council, the first urban first farm in a container was launched next to the Tampines Round Market & Food Centre in November 2023, reducing delivery time and transport costs as the fish can be farmed onsite.

The first batch of freshwater fish, jade perch, was harvested in June 2024 and sold in the fish stalls in the market. The fish is high in Omega-3 fatty acids and is said to improve heart health.

Impact

“Real fresh fish, anytime, anywhere and is affordable”

It aims to meet the growing consumption of fish in urban cities, reduce carbon footprint in the supply chain process and ensures the sustainability of wild fish stocks.

It provides maximum growth with minimal production costs, in a sustainable manner that benefits not just fish farmers, but also communities and the environment.



Supporting Singapore's Life Sciences Ecosystem

Fight against Dengue in Urban Cities

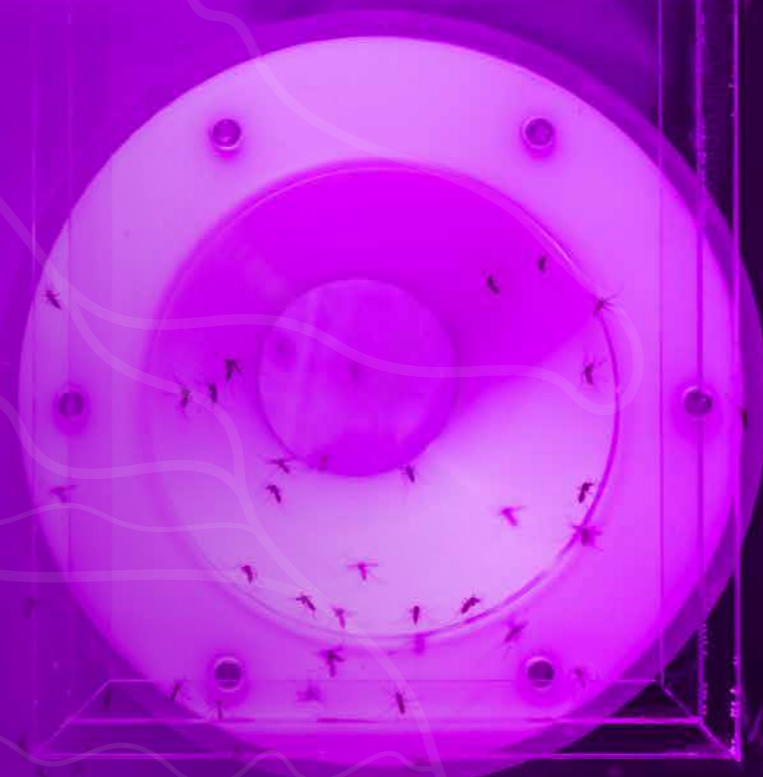


The World Health Organization (WHO) has issued a clear warning: global warming is driving an unprecedented rise in dengue infections worldwide¹.

In the first quarter of 2024, Singapore reported over 5,000 dengue cases—an alarming figure that more than doubled compared to the same period last year. Beyond the health impact, dengue places a significant economic burden on our nation, estimated at S\$1.4 billion to S\$3.1 billion between 2010 and 2020².

Currently, there is no specific treatment for dengue. It can be fatal in severe cases.

In the fight against dengue in Singapore, National Environment Agency (NEA) is utilising the *Wolbachia-Aedes* suppression technology where male *Wolbachia*-carrying *Aedes aegypti* (*Wolbachia-Aedes*) mosquitoes are released. When these newly-introduced male *Wolbachia-Aedes* mosquitoes mate with the native female *Aedes aegypti* mosquito that do not carry *Wolbachia*, the resultant eggs will not hatch, thus reducing the *Aedes aegypti* population over time.



Interventions

Although results from locations where the male *Wolbachia-Aedes* mosquitoes have been released for more than a year, such as Tampines and Yishun, have shown a 98% reduction in dengue mosquito population and up to 88% drop in dengue cases, NEA had highlighted that Project *Wolbachia* is “not a silver bullet” and the *Wolbachia* technology is still evolving with potential for improvement³.

TLL scientists are collaborating with scientists at the Environmental Health Institute (EHI), a research institute under NEA, to develop local strains of *Wolbachia*-infected *Aedes* mosquitoes that will allow for the large-scale nationwide roll out, while developing options to ensure that Project *Wolbachia* remains an effective method of suppressing the local mosquito population.

In addition, TLL scientists are also working on improving the precision and reliability of sterile insect technology (SIT). SIT uses radiation to selectively induce sterility in the newly-introduced male mosquitoes so that they do not produce offspring when they mate with the uninfected native female mosquitoes. This is an additional tool, that will help Singapore ensure the native mosquito population is not replaced by the *Wolbachia*-infected mosquitoes over time. Otherwise, it is possible for the *Wolbachia*-infected mosquitoes to establish themselves as the dominant population, reducing the effectiveness of the *Wolbachia* strategy.

Impact

The research would contribute to the successful nationwide implementation of Singapore's *Wolbachia* suppression strategy and greatly reduce dengue incidences, as well as its associated economic burden.

¹ “Spike in dengue cases due to global warming, warns WHO” 21 July 2023

² Soh et al. (2021) PLOS Global Public Health.

³ “Project *Wolbachia*: 300 million mosquitoes released but not a silver bullet to deal with dengue, says NEA” Channel News Asia, 21 September 2023

Advancing Scientific Standing

20th Anniversary Symposium: Life in a Changing Environment



The symposium brought together leading scientists from diverse fields to share their latest research on stress, environmental and dietary responses, aging, cellular homeostasis and host-bacterial/pathogen interactions in health and diseases. It provided a platform for diverse researchers to exchange ideas and forge meaningful collaborations to understand how life thrives in a changing environment.

The symposium featured Prof Rong Li from Mechanobiology Institute and Prof Linfa Wong from Duke-NUS Medical School as keynote speakers. It attracted more than 150 participants from various local and overseas organisations including NUS, NTU, A*Star, KKH, University of Missouri School of Medicine, University of Tsukuba, Environmental Health Institute National Environment Agency and SInglab.Technologies



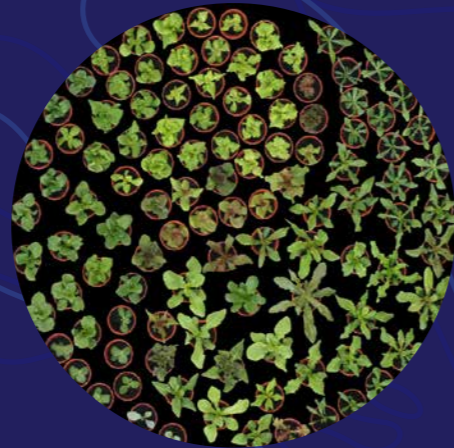
In celebration of its 20th anniversary, TLL held a Symposium on 20 & 21 July 2023 with the theme "Life in a Changing Environment".

We live in a world that is constantly changing. To thrive, living things respond and adapt to various types of changes at multiple levels, ranging from cellular to organismic.

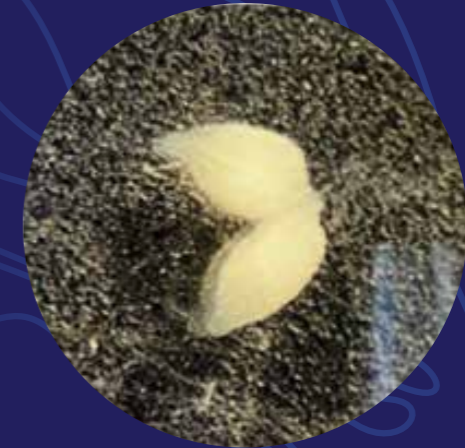


Papers contributed to Scientific Journals

Our researchers discovered DNA variations and their associations with important agronomic traits such as yields, nutrient development and disease resistance to address food security for future urban centres. The research was published the journal *Genome Biology*.



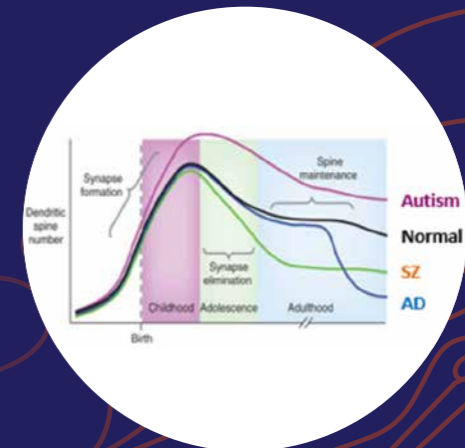
Our researchers are improving maternal and child health through scientific partnership and breakthrough discoveries in understanding cellular mechanisms surrounding inheritance and reproductive biology including aging. The research was published in the journal *Nature Communications*.



Our researchers developed safe and targeted sterile insect technology to address vector borne diseases for urban centres. The research was published the journal *BMC Biology*.



Our researcher studied the understanding of molecular basis of autism spectrum disorders. The research was published the journal *Proceedings of the National Academy of Sciences of the United States of America (PNAS)*.



Source: Penzes P. et al., *Nat. Neurosci.* 2021

Meet our researchers



RICHARD LE BOUCHER

Principal Investigator & Director, Commercial Strategy (Aqua)

Richard grew up in France, earned his agronomy engineer's degree in aquaculture from Ecole Nationale Supérieure Agronomique de Rennes (ENSAR-ENSAIA), Doctor of Philosophy in quantitative genetics and nutrition at AgroParisTech, and Master of Business Administration from École des Ponts ParisTech. As an undergraduate working on probiotic use in hatcheries at The

Southeast Asian Fisheries Development Centre (SEAFDEC) in the Philippines, Richard developed a keen interest in aquaculture, in particular the potential of global aquaculture growth to address the combined goals of food safety, environmental sustainability and social responsibility. In 2020, he relocated to Singapore and joined TLL. He specialises in conducting research related to nutrition, genetics and farming systems. He also leads commercial strategy for aquaculture at the institute.

Tell us about your current research project.

Our core research focuses on making the incorporation of new sustainable ingredients into aquafeed possible. We are also excited to soon begin developing antibiotic-free disease treatments for barramundi and shrimp. Recently, we are coordinating the coming AquaPolis research programme which is led by the Singapore Food Agency. The programme aims to transform the aquaculture research landscape by bringing together research institutes, institutions of higher learning, farms and companies to reap strategic synergies in developing innovative aquaculture solutions.

What motivated you to pursue a career in research?

My motivation stems from tackling the complex challenge of balancing global food security with environmental sustainability. I believe this is where I can contribute meaningful solutions. To me, ensuring enough food for the population without jeopardising the future of our planet is the most critical issue for humanity.

How do you stay updated on the latest developments in your field?

I keep myself informed by reading research articles and industry magazines, as well as investment news to spot trends. However, no method is more effective than direct interactions with farmers to gain practical insights.

What are your long-term goals as a researcher?

I aim to find a position where I can impact food security and sustainability, helping farmers and society by bringing creative ideas to reality.



GOH FENG GUANG

Junior Research Fellow

Feng Guang is a Singaporean and is now a Junior Research Fellow pursuing his PhD in mosquito biology. Since joining TLL 7 years ago, he was involved in the set up of TLL's arthropod facility and has been working on various projects related to the understanding of the mosquito olfactory system, development of a mosquito specific transgenic platform and Wolbachia strain generation. He is

passionate about leveraging the power of life sciences to improve lives and looks forward to making more discoveries that will positively impact society.

Tell us about your current research project.

My current research focuses on identifying and analysing a gene named *Transformer-2 Beta* in the major dengue vector mosquito *Aedes aegypti*. We "knocked out" the gene and it turns out that the loss of the gene leads to infertility in the male mosquitoes. We are trying to understand the link between the infertility and the gene. This project excites me as we could potentially link the gene to infertility in mammals as the gene is highly conserved. Furthermore, the gene has potential to be used in a gene drive system for *Aedes* mosquito population control.

What motivated you to pursue a career in research?

I am often driven by the fascination of understanding how things work, and I enjoy the systematic process of breaking down complex issues into smaller problems that can be solved.

Why did you select to join TLL?

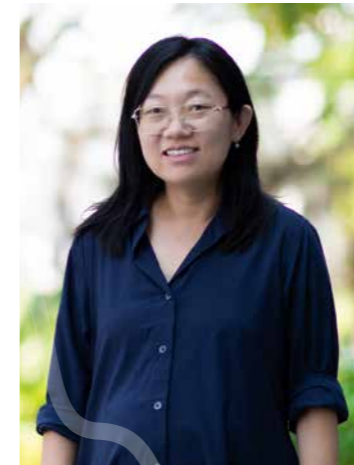
TLL's mission to harness the power of life sciences to improve lives also resonated greatly with me. I was drawn to TLL by the opportunity to be involved in the set up of a new facility dealing with mosquitoes. At that point, I had just graduated from NTU, and felt that this was a good opportunity to delve into both the basic and translational scientific research.

Describe a significant achievement or breakthrough in your research.

One significant milestone for my research was the generation of my first transgenic mosquito by editing the genome using CRISPR-Cas9 (a genome editing tool), whose elements were introduced into the embryos through microinjection. The basis of the microinjection of the genome editing elements provides a platform for other experiments.

What are your long-term goals as a researcher?

I hope to expand my field of research and further develop my skills as a researcher. I want to apply what I have learnt along the way and further the advancement in scientific knowledge. I would love to have the opportunity to mentor future researchers and hope to nurture future generations of scientists.



SHEN LISHA

Principal Investigator

Lisha received her Bachelor degree from Shanghai Jiao Tong University (China) in 2006 and Ph.D. degree from National University of Singapore (NUS) in 2010. She joined Temasek Life Sciences Laboratory (TLL) as a Junior Research Fellow in 2010 and was promoted to Research Fellow in 2011. She established her independent group as a Research Investigator in TLL from April 2018. She has a keen research interest in the regulation of flowering time, biomass accumulation and genome editing in plants and leafy vegetable breeding.

Tell us about your current research project.

My group is currently working on genetic improvement of indoor farming crops. Our research focuses on developing high-efficiency breeding pipelines, tailored for urban farming environments, to produce leafy vegetables with enhanced yields and nutritional values. If successful, this project will help boost food security and create a sustainable urban farming industry in Singapore.

Describe a significant achievement or breakthrough in your research.

A significant achievement in my research has been the discovery of DNA methylation variations in a large collection of lettuce with diverse growth patterns and morphologies. These variations act as molecular switches, influencing gene activity without altering the DNA sequence itself, thereby shaping diverse growth patterns and morphologies in lettuce. Understanding these DNA methylation variations has provided profound insights into the domestication and evolutionary processes that have driven lettuce diversity. Crucially, these variations are linked to important agronomic traits, offering valuable resources for sustainable agriculture and breeding practices. This breakthrough holds promise for developing new lettuce varieties with enhanced biomass and resilience to environmental stressors, ultimately contributing to current efforts to improve global food security.

What are your long-term goals as a researcher?

My long-term goal is to become an expert in agriculture research and make significant contributions to addressing food security challenges in a changing environment. I envision leading innovative research projects that develop sustainable agricultural practices and resilient crop varieties capable of thriving in diverse and evolving environmental conditions. Ultimately, I aspire to bridge the gap between scientific research and practical application, ensuring that my work has a tangible impact on global food systems. By collaborating with diverse stakeholders and leveraging emerging technologies, I aim to contribute to creating more secure and sustainable food production methods that can withstand environmental challenges and benefit communities worldwide.

Financial Highlights

For the financial year ended 31 March 2024

	2023 S\$	2024 S\$
For the year		
Donations received, revenue and other income	30,986,181	32,159,618
Operating grants received and deferred capital grants amortised	10,546,471	12,021,489
Total Expenses	(39,919,038)	(43,237,187)
Operating surplus	1,613,614	943,920
At year end		
Net assets	71,317,512	67,749,955

