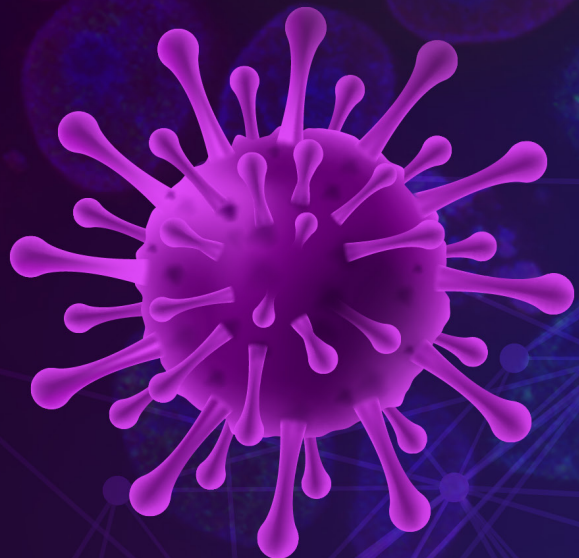


# CSI SINGAPORE

2023  
ANNUAL  
REPORT



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# 01

# INTRODUCTION

## 2023 – WHAT AN INCREDIBLE YEAR FOR CSI SINGAPORE

2023 marks the 15th year since the establishment of the Cancer Science Institute of Singapore at the National University of Singapore, and what a year it has been for all of us! The World Health Organization (WHO) officially declared the end of the COVID-19 pandemic, with the world re-opening up for all. International travels resumed, allowing for physical meetings and conferences to return to the forefront. This was much anticipated by the global scientific community where face-to-face meet-ups can spur the most innovative collaborations.

In the past year, this was exactly what CSI Singapore was working towards – ground-breaking collaborations with our local and global partners. We have achieved recognition through numerous awards and honors which our scientists and students have obtained. The impact, breadth and quality of the institute's research is also evident in our list of publications in high impact scientific journals.

The turbulent environment in the previous year has only reinforced our commitment and CSI Singapore will continue to strive towards our mission to better understand the causes of human cancer across Asia, and thereby improve its detection, treatment and prevention. Our outstanding researchers and exceptional facilities will persevere in creating an energetic environment for ground-breaking science and world-class training.

We at CSI Singapore hope that you will find our 2023 Annual Report informative, interesting, and inspiring. We look forward to a brighter and better 2024 for all.

### CSI Singapore



### A. CORE FACILITIES

**Fluorescence  
Activated Cell Sorting  
(FACS) Facility**

LOW Jun Siong

**Genomics and  
Data Analytics Core  
(GeDaC)**

Jason PITT

**Microscopy and  
Multiplex Assays Core**

Anand D.  
JEYASEKHARAN

**Quantitative  
Proteomics Core**

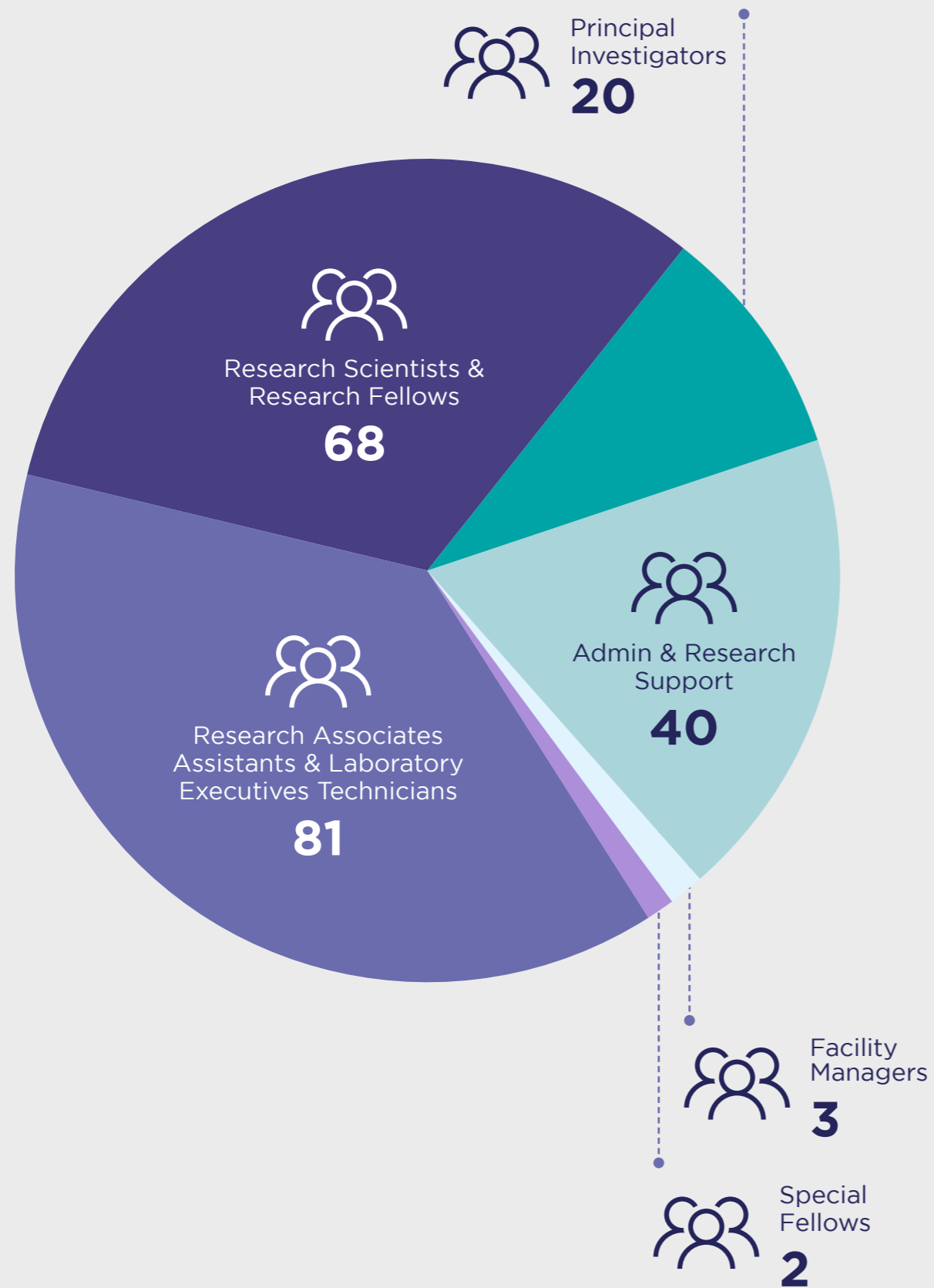
Dennis KAPPEI

**Transgenic and  
Gene Targeting Facility**

Yvonne TAY



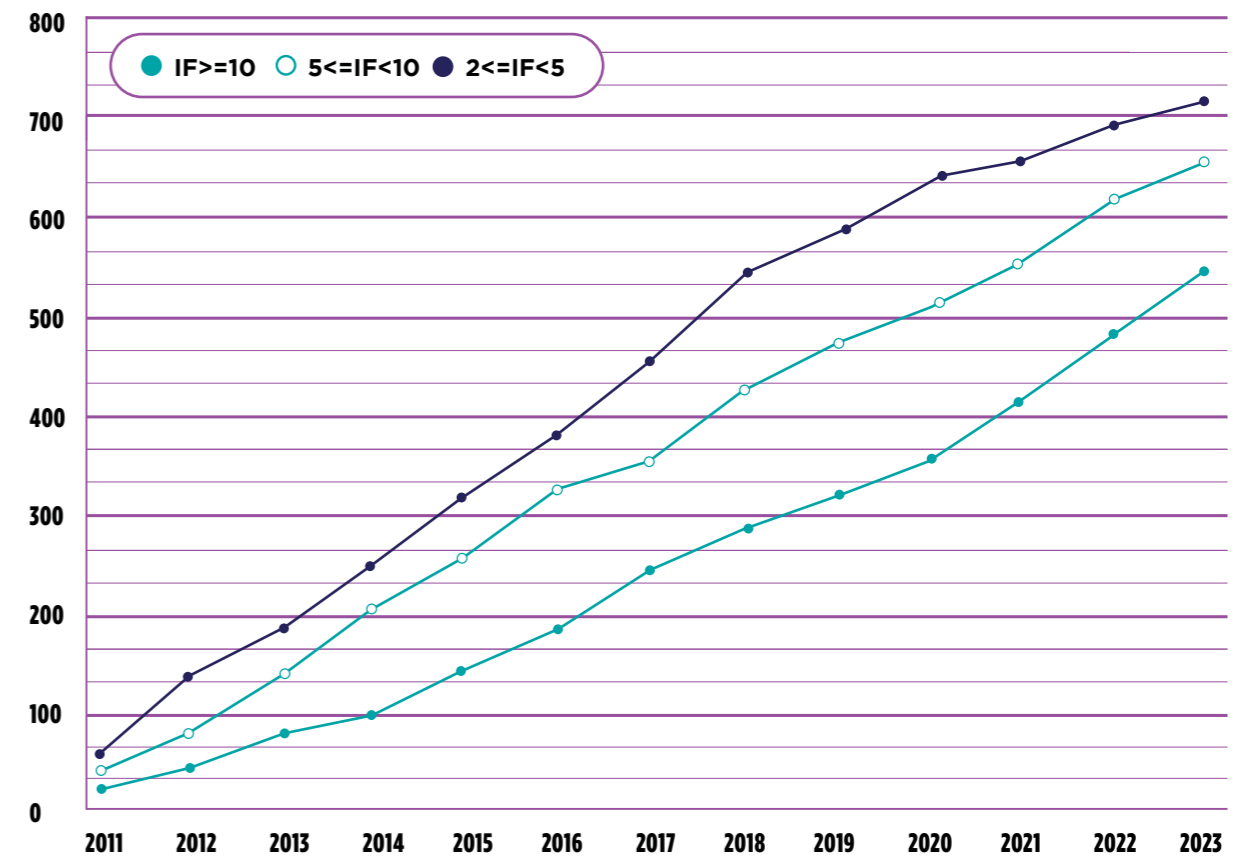
## B. STAFF STRENGTH INFOGRAPHICS



## C. PUBLICATION HIGHLIGHTS



Cumulative Publications Based on IF Score:



## D. COLLABORATION NETWORK



### 2023 Top Collaborations by Country:

- |                   |                |
|-------------------|----------------|
| 1. United States  | 6. Italy       |
| 2. Japan          | 7. Canada      |
| 3. China          | 8. Germany     |
| 4. United Kingdom | 9. South Korea |
| 5. Australia      | 10. Spain      |

## E. LOCAL COLLABORATION

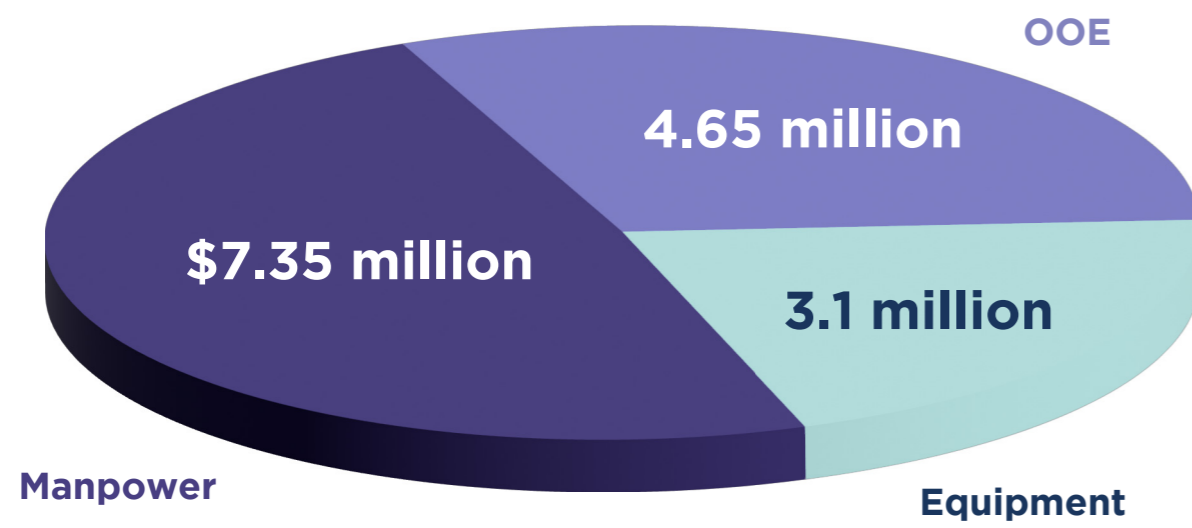
-  **NUS**  
National University of Singapore
-  **MOH HOLDINGS**
-  **Agency for Science, Technology and Research**  
SINGAPORE
-  **National Cancer Centre Singapore**
-  **Singapore General Hospital**
-  **NANYANG TECHNOLOGICAL UNIVERSITY**  
SINGAPORE
-  **SingHealth**  
Defining Tomorrow's Medicine
-  **National Heart Centre Singapore**
-  **Tan Tock Seng HOSPITAL**  
National Healthcare Group
-  **KK Women's and Children's Hospital**  
SingHealth
-  **Changi General Hospital**  
SingHealth
-  **Singapore National Eye Centre**  
SingHealth



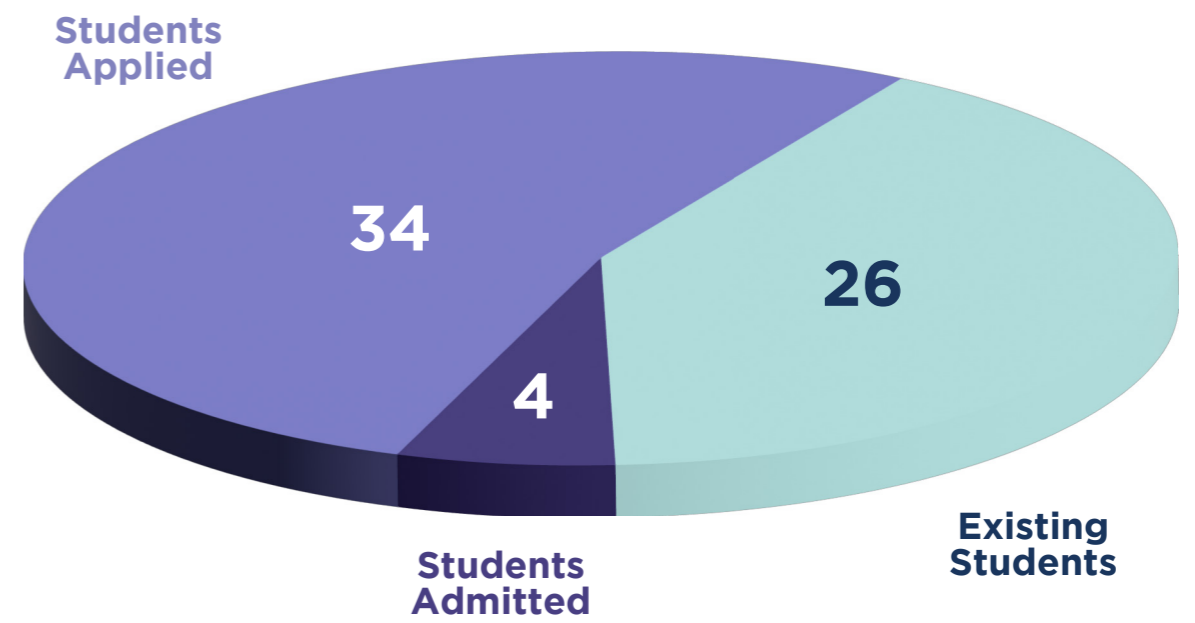
## E. FINANCIAL HIGHLIGHTS

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FY 2023 Expenditure (SGD)



CSI Graduate Program 2023



## A. SELECTED RESEARCH HIGHLIGHTS IN 2023

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### New Insights in Combating Cancer

#### **De novo Protein Fold Design through Sequence-independent Fragment Assembly Simulations [Proc Natl Acad Sci USA, Jan 2023]**

De novo, or new, protein design generally consists of two steps: structure and sequence design. Many protein design studies heretofore mainly concentrate on sequence design with scaffolds adapted from known structures in the Protein Data Bank (PDB), which neglects to explore novel areas of protein structure and function space. In this study, a group of researchers, led by CSI Singapore's **Professor Yang ZHANG**, developed FoldDesign, a programme that can create novel protein folds from specific secondary structure (SS) assignments through sequence-independent replica-exchange Monte Carlo (REMC) simulations. This programme opens new possibilities for studying both structural and functional spaces through computational design simulations that natural proteins have not achieved through evolution.

#### **Core Binding Factor Fusion Downregulation of ADAR2 RNA Editing Contributes to AML Leukemogenesis (Blood, Feb 2023)**

A team of researchers from the CSI Singapore, co-led by **Professor Daniel G. TENEN** and **Associate Professor Polly CHEN Leilei** has for the first time discovered a hitherto unappreciated mechanism leading to ADAR2 (adenosine deaminases acting on RNA) dysregulation in core binding factor acute myelogenous leukaemia (CBF-AML) and highlights the functional relevance of ADAR2's role in leukemogenesis.

This work propels the team to delve deeper on the causes and functional consequences of ADAR2 dysregulation in multiple diseases including cancer as well as the underlying mechanisms (editing-dependent or independent) leading to pathogenesis. CBF-AML is considered a good-risk AML in the context of chemotherapy. However, the ability to modulate the level of ADAR2 and editing frequency of its RNA substrates may hold great potential for the development of RNA therapeutics against CBF-AMLs.



### Super-enhancer-driven TOX2 Mediates Oncogenesis in Natural Killer/T Cell Lymphoma (Mol Cancer., Apr 2023)

A team of researchers from CSI Singapore, led by **Professor CHNG Wee Joo** and **Associate Professor Takaomi SANDA**, has discovered that a transcription factor, TOX2, was aberrantly increased in patients with Natural killer/T-cell lymphoma (NKTL). The increased TOX2 level leads to the growth and spread of NKTL, as well as the overproduction of PRL-3 - an oncogenic phosphatase that is a known key player in the survival and metastasis of several other types of cancers. This breakthrough discovery presents a potential novel therapeutic target to treat NKTL.

### Patterns of Oncogene Coexpression at Single-Cell Resolution Influence Survival in Lymphoma (Cancer Discov., May 2023)

A team of researchers at Cancer Science Institute of Singapore, led by **Dr. Anand JEYASEKHARAN**, set out to determine whether and how oncogenes work together to resist treatment. They studied this phenomenon in the setting of Diffuse large B cell lymphoma (DLBCL), which is the most common haematological cancer in Singapore and worldwide. Using a state-of-the-art imaging technology termed multispectral microscopy with quantitative immunofluorescence, the study team were able to stain, image and quantify these oncogenes simultaneously in a large number of samples from patients with DLBCL.

They made an unusual discovery, that the survival of these patients was strongly linked to the percentage of cells expressing a unique combination of oncogenes - positive for MYC and BCL2, but negative for BCL6 (M+2+6-). These cells impacted the survival of patients more than any other subset, including cells that were positive for all three oncogenes. The team went on to identify potential mechanisms for why BCL6 is "protective" for cells with high MYC and BCL2. A key additional finding reported by the team in the publication was a simple mathematical formula that could "predict" the fraction of cells with this unique unfavourable oncogenic combination from immunohistochemistry data, and thereby extend its use even to routine clinical practice. This is currently being explored further in international collaborations led by the team at NUS.

### Single-cell Profiling of Gastric Cardia Adenocarcinoma Reveals Drivers of Cancer Stemness and Therapeutic Targets (Gut, Jun 2023)

A study conducted by **Professor Patrick TAN** and PhD student Yunqiang Chu from CSI Singapore and Duke-NUS Medical School, provides insights into the potential origins of gastric cardia adenocarcinoma (GCA) and its relationship with OAC. Further understanding of these pathways could lead to improved diagnostic and therapeutic strategies for GCA. Gastric cancer (GC) is a leading cause of global cancer mortality, with over 700,000 deaths in 2020. While most cases occur in the distal stomach, about 18% are proximal gastric cardia adenocarcinomas (GCA). Previous studies have found similarities between GCA and esophageal adenocarcinoma (OAC), suggesting they may arise from normal gastric cardia cells through different processes.

### 3'UTR Heterogeneity and Cancer Progression (Trends Cell Biol., Jun 2023)

A group of researchers, led by CSI Singapore's **Dr. Yvonne TAY** discusses the generation of alternative 3' untranslated regions (UTRs) in human mRNA molecules. The paper highlights the importance of 3'UTR heterogeneity and its implications in cancer. Genomic variants within 3'UTR regions and abnormal processing of 3'UTRs can alter the landscape of gene expression and have been associated with cancer development. Through the use of advanced sequencing technologies and computational analyses, researchers have uncovered evidence suggesting potential interplay between these processes. Dysregulation of this crosstalk may further contribute to the pathogenesis of cancer. Emphasizing the need for a comprehensive understanding of these events to fully appreciate their significance and drive therapeutic advancements in the field. Further characterization of alternative 3'UTRs and their regulatory mechanisms will provide valuable insights into cancer biology and potentially uncover novel therapeutic targets.

### Curcumin in Cancer Therapy: Exploring Molecular Mechanisms and Overcoming Clinical Challenges (Cancer Lett., Aug 2023)

A study led by **Professor Boon Cher GOH** from CSI Singapore, highlights how cancer treatment has relied heavily on chemotherapy and radiotherapy, which come with challenges such as resistance and side effects. While targeted therapy and immunotherapy have shown progress, new alternatives are sought. Curcumin, a natural polyphenolic phytoalexin, has gained attention for its wide-ranging biological effects in recent years. This review explores curcumin's role in cancer therapy, emphasizing its mechanisms for inducing cell death and inhibiting tumor metastasis. The review also addresses clinical challenges and ongoing efforts to harness the potential of curcumin, contributing to the evolution of cancer treatment strategies.

## Mechanisms and Context-dependent Roles of TAL1 in T-cell Acute Lymphoblastic Leukemia (Haematologica, Oct 2023)

T-cell acute lymphoblastic leukemia (T-ALL) is an aggressive malignancy derived from thymic T-cell precursors. Approximately 40-60% of T-ALL cases exhibit aberrant overexpression of the TAL1 oncogenic transcription factor. Here, a team of researchers from the CSI Singapore, led by **Associate Professor Takaomi SANDA**, provides a comprehensive view of the TAL1-induced transcriptional program in human T-ALL cells using a rapid protein degradation system coupled with integrative approaches. Their study demonstrates that TAL1 targets can be classified into several groups, each of which exhibits unique gene expression kinetics, chromatin features, and regulatory mechanisms. The group aims to expand the fundamental findings behind the pathogenesis of cancers and to contribute to the improvement of cancer prognosis through the discovery of novel therapeutic drugs that can efficiently inhibit the primary oncogenic mechanisms of T-ALL.

## Integrating End-to-end Learning with Deep Geometric Potentials for ab initio RNA Structure Prediction (Nat Commun, Sep 2023)

A study led by **Professor Yang ZHANG** from CSI Singapore, made use of artificial intelligence (AI) and deep-learning techniques to improve the accuracy of RNA 3D structure prediction from the RNA sequences. Specifically, the team developed a new AI-based method, DRfold, which utilizes a cutting-edge deep-learning technique, called transformer attention neural network, to train a hybrid potential function. This potential function is then used to guide the folding simulation of RNA structure construction. The deep learning potential can help generate high-quality RNA structure models, which are much more accurate than the traditional approaches based on physical or statistical potentials. According to their benchmark test, DRfold can improve the accuracy of the RNA models by >70% over previous approaches. One of the major motivations for the current study is to bridge the gap between the low availability of experimental RNA structures and the high demands of the field of RNA biology and drug industry.

Professor Yang and his team hopes to extend the AI strategy for protein-RNA interactions. As there is no reliable AI approach for high-quality protein-RNA complex structure prediction, such tools will be highly relevant for RNA function annotation and RNA drug discovery. Novel strategies and ideas are needed to break through the bottleneck of high-accuracy RNA structure predictions, and they are currently working on it with encouraging progress.

## B. KETOGENIC DIET AND ITS EFFECTS ON TUMOUR GROWTH AND 'WASTING SYNDROME'



Ketogenic (i.e., high-fat and low-carbohydrate) diets have recently attracted attention as potential adjuvants that increase the efficacy of cancer therapy. It is speculated that cancers feed on sugar, and a ketogenic high-fat diet may enhance anti-cancer therapy and improve clinical outcomes by 'starving' the tumour.

**Professor Ashok Venkitaraman** of the Cancer Science Institute of Singapore (CSI Singapore), National University of Singapore (NUS), together with Dr. Tobias Janowitz of the Cold Spring Harbor Laboratory in New York, and an international group of researchers from the USA and UK, reported their ground-breaking findings in a paper published in the scientific journal *Cell Metabolism* on 12 June 2023. Here, they showed using two different model systems that such diets can indeed slow cancer growth – but unexpectedly, they cause a 'wasting syndrome' (cachexia) which worsens the disease prognosis. Prof. Venkitaraman said, "Special diets may help to make cancer therapy more effective. However, our work highlights that dietary interventions affect many organ systems, not just cancer cells, and so they may have deleterious as well as positive consequences. The mechanism we have identified raises questions regarding the use of high-fat or starvation diets in the treatment of cancer."

The study also found that dexamethasone, a potent glucocorticoid, which improves appetite and increases endogenous glucose production, can delay cachexia. When taken together with a ketogenic diet, such drugs may allow suppression of tumour growth, without the undesirable effects of cachexia. New combinations of this kind may be necessary to optimize dietary intervention as a part of cancer therapy. Ultimately, more work is needed to translate this preclinical research for the benefit of patients suffering from cancer.

This paper was featured in The Straits Times on 28 August 2023 - <https://www.straitstimes.com/singapore/health/keto-diet-can-fight-cancer-but-also-poses-risks-study>



## WELCOME TO OUR NEW PIs

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### DR. ANTHONY KHONG

Dr. Anthony Khong is a molecular biologist, who did his postdoctoral fellowship at the University of Colorado Boulder and the Howard Hughes Medical Institute. Dr. Khong obtained his Bachelors in Science, majoring in Biochemistry and Molecular Biology and also in Chemistry at the University of British Columbia in 2008. He then received his Doctorate of Philosophy in Biochemistry and Molecular Biology at the University of British Columbia in 2015. In his academic career, he published 18 papers, including seven first-author articles, and was awarded a Banting Postdoctoral Fellowship. Dr. Khong's main research areas are RNA biology and stress granules, a type of biomolecular condensate that appears during cellular stress. Dr. Khong's most recent research has provided novel fundamental insights into how stress granules assemble and how stress granules promote chemoresistance. Dr. Khong joined CSI Singapore as a Principal Investigator in 2023.

#### What appealed to you about CSI Singapore?

I was drawn to CSI Singapore for several compelling reasons. Firstly, the vibrant and intellectually stimulating environment, coupled with colleagues who are both motivated and enjoyable to work with. Secondly, the inspiring vision of our Head of Department, Professor Venkitaraman, to establish the best Cancer Centre in Asia. Thirdly, CSI's emphasis on advancing its RNA biology program aligns perfectly with my research interests. Lastly, the collaborative systems in place, particularly with NUS Centre for Cancer Research (N2CR), provide excellent opportunities to work closely with clinicians.

#### How has the shift been from Howard Hughes Medical Institute (HHMI) to CSI Singapore?

The shift from being a postdoctoral fellow at HHMI to a principal investigator at CSI Singapore was significant. While my focus was solely on answering research questions as a postdoc, my role as a principal investigator now involves balancing research with teaching, mentoring, service, and grant writing. Despite the initial challenges, I find these activities complement my research well. For example, teaching enhances my ability to organize and communicate scientific ideas effectively. Moreover, I am fortunate to teach courses directly related to my research interests, such as the tumour biology course (LSM4243) and advanced topics in RNA biology (CDM5103), allowing me to gain a broader perspective beyond my research goals.

#### What are you most excited to work on/working on at CSI Singapore?

I am most excited to work on discovering and dissecting RNA-mediated mechanisms that enable cells to adapt amidst diverse cellular stresses, particularly those induced by the tumour microenvironment. One particular example that I am interested in is stress granules. These are micro size structures that form when cells experience a diverse range of stresses. These structures are thought to aid cancer cells in surviving the tumour microenvironment, facilitating oncogenic induction, promoting metastasis, and chemoresistance. My laboratory aims to discover and dissect the molecular basis that explains how stress granules are involved in all these cancer-related phenotypes.

#### If you had one superpower, what would it be and how would you use it?

If I could have one superpower, I would choose the ability to possess all the knowledge to cure any diseases affecting humanity. My plan would be to share this knowledge far and wide, empowering not only individuals but also scientists. Together, we would form a league of health heroes, creating groundbreaking therapeutics and treatments. I would be the ultimate knowledge broker, ensuring that the knowledge to conquer diseases is put to use in labs and research centers worldwide.

#### If your research had a theme song, what would it be, and why?

"Stronger" by Kelly Clarkson. One leading idea about stress granules is that they help cancer cells adapt and survive acute stresses. Hence, I think that is why this song, with the lyrics "what doesn't kill you makes you stronger," fits really well with my research topics.



## WELCOME TO OUR NEW PIs

### DR. JUN LOW SIONG

Dr. Jun Siong Low received his BSc in Biomedical Science from University College London and his PhD in Immunobiology from Yale University. During his PhD study with Prof. Susan Kaech and Prof. Richard Flavell, Dr. Low used various mouse models to study the mechanisms of CD8+ memory T cells reactivation in different tissue compartments. He then moved to Switzerland for his postdoctoral training with human immunologists Prof. Federica Sallusto and Prof. Antonio Lanzavecchia at the Institute for Research in Biomedicine, where he used clonal approaches to dissect human T and B cell responses to self and non-self antigens. Dr. Low subsequently worked at ETH Zurich as a Novartis Young Investigator before moving to CSI Singapore to join us as a Principal Investigator.

#### What appealed to you about CSI Singapore?

CSI is one of the globally recognized research centres working on cancer biology. The quality of the scientific output from CSI is high and there is, quite uniquely, a community of clinician scientists who are also faculty members and actively collaborate with basic scientists. Such close interaction fosters exchange of knowledge and clinical perspectives, bridges the gap between bench and bedside, and enables translational potential. The strong focus on cancer biology in CSI complements my immunology background to explore my research interest - immunooncology.

#### How has the shift been as a Novartis Young Investigator in Zurich to an Assistant Professor at CSI Singapore?

The transition was exciting and challenging at the same time. Having been away for over 12 years strikes a sense of familiarity and nostalgia when I return to Singapore. Although my past trainings at UCL, Yale, IRB and ETH have, in many ways, prepared me for this position, setting up one's own research programme warrants additional skillsets, responsibilities and a steep learning curve. To this end, the admin team and the community at CSI and NUS have been extremely supportive in helping me assimilate into the system.



#### What are you most excited to work on/working on at CSI Singapore?

My lab's primary interest is to study the T and B cell responses to cancers, particularly in pathogen-driven cancers. We are interested in understanding how our immune system reacts during tumorigenesis, how immune pressure shapes tumor progression and how immune cells contribute to tumor regression. Our ultimate goal is to leverage or boost our immune system to fight against cancer.

#### If you had one superpower, what would it be and how would you use it?

If I had a choice, my superpower would be time control so that I could speed up the incubation and culture times and go straight to results.

#### If your research had a theme song, what would it be, and why?

If you can't find an appropriate theme song, make one. "Rejected" by my previous PI Richard Flavell is quite apt and entertaining. Have a listen on Youtube if you haven't already - story of a PI's life. <https://youtu.be/vQLKoGNFXgU?si=ryDo6aYSA-EhYFJi>



## CANCYCLE 1ST EDITION 2023

This is the first time we staged a cycling fundraiser, so it is quite heartening to see the support given through signing up to cycle or by donating.

This cyclethon fundraiser was set up to champion research in cancer and garner funds to ensure its longevity. Research is an ongoing effort and, a vital backbone of this is funding. Steady funding would aid in ensuring the continuity of research in the field. And to further translate scientific research in the labs to viable medical treatments for patients, treatments that are more specific, more targeted and most importantly, less discomfort.

Cancer is a heavy physical and emotional burden to bear. With the lives of patients and their families so closely intertwined, the provision of more accurate treatments will vastly reduce the strain on all of them. One of our shared goals is to accelerate the pace and global impact of basic, translational and clinical cancer research across NUS and NUHS. And apply this new knowledge for the benefit of cancer patients through improvements in cancer detection, treatment, and eventually, prevention. Medical care is a gift that continues to give. And the gift of your support is the pillar of goodwill that enables it to do so.

Another of our shared objectives is to engage with the general public to bring greater awareness on cancer research, to let them know how such research is tackling this national challenge. We are glad that through CanCycle we are able to connect better with the community. Hopefully, this is just the beginning and that we will find many more opportunities to fruitfully engage a wide variety of audiences.

Through various collaborative efforts, we hope to provide medical care that will relinquish the unpredictability of outcome and offer the reassurance of recovery.

The Cancycle 2023 1st Edition was jointly organised by the Cancer Science Institute of Singapore, National University Cancer Institute, Singapore (NCIS) and the National University of Singapore Centre for Cancer Research (N2CR).

It has raised more than \$50,000 for cancer research. Steadily, determined research efforts will pave the way to the end of cancer disease as we know it.



## CSI SINGAPORE @ AACR 2023



CSI Singapore exhibited at the AACR Annual Meeting 2023 held in Orlando, Florida. Aside from a showcase booth as well as student and staff presentations, CSI Singapore also exhibited at the 2023 Cancer and Biomedical Research Career Fair at the AACR conference. Poster presenters from CSI Singapore included Julia Sze Lynn Lim, Michal M Hoppe, Phyllis SY Chong, Associate Professor Edward Chow and Professor Yoshiaki Ito.

The AACR Annual Meeting, which saw participation from over 21,700 registrants representing 87 countries and territories, serves as a gathering that unites scientists, clinicians, healthcare professionals, survivors, patients, and advocates to exchange the latest developments in cancer science and medicine. By exhibiting at AACR 2023, CSI Singapore not only had the chance to showcase its status as a world class cancer research institution on a global stage but also spotlighted Singapore as an innovative global hub for the healthcare industry. During the conference, the Frontiers in Cancer Science Conference was also introduced, providing an opportunity for those interested to gain insights into both CSI Singapore and the research landscape in Singapore.

The presentations delivered by staff and students facilitated the exchange of ideas and allowed connections with peers, alumni of CSI Singapore and potential collaborators to be made. This created a valuable networking opportunity for future research collaborations. The visibility gained through these presentations and showcase booth further enhance our institute's reputation within the scientific community and beyond.

## DEPUTY PRIME MINISTER, COORDINATING MINISTER FOR ECONOMIC POLICIES, AND CHAIRMAN, NRF, HENG SWEE KEAT VISIT TO THE CANCER SCIENCE INSTITUTE OF SINGAPORE (CSI SINGAPORE)

We are grateful for the visit of Deputy Prime Minister, Coordinating Minister for Economic Policies and Chairman, NRF, Heng Swee Keat to the Cancer Science Institute of Singapore (CSI Singapore) on 31 July 2023. It was an extraordinary occasion where we featured cutting-edge cancer research.

During the visit, we showcased our state-of-the-art High-End Automated Cell Explorer platform, enabling high-throughput screenings of drug-protein interactions, as well as our Quantitative Proteomics Core. These revolutionary technologies accelerate the discovery of novel cancer therapeutics, bringing us closer to more effective treatments. Director Prof. Ashok Venkitaraman of CSI Singapore and our faculty members shared their insights into cancer cell behaviour and treatment responses.

DPM Heng was happy to meet with our inspiring PhD students and research fellows who are passionate about cancer research, regardless of their diverse backgrounds. Their dedication embodies the future of cancer science, and we are committed to nurturing this next generation of researchers. We extend our heartfelt appreciation to DPM Heng for his support and encouragement. Together, we will continue pushing the frontiers of cancer research and translating breakthroughs into better clinical outcomes.



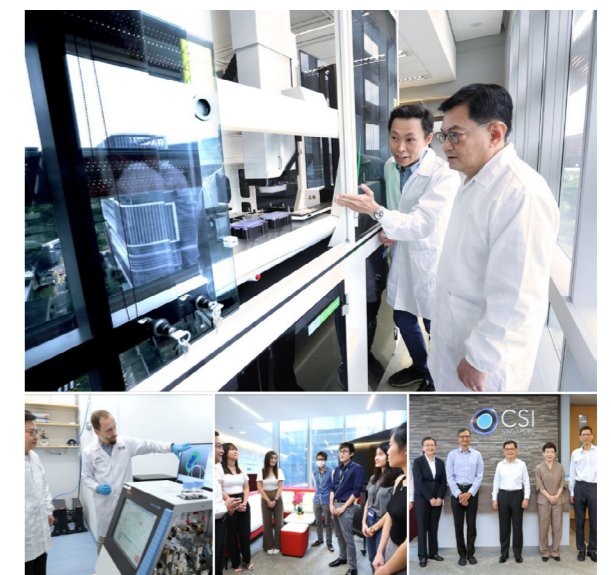
Heng Swee Keat

3 August 2023 · 🌐

One of our goals in growing Singapore's ecosystem for scientific research is to strengthen our healthcare capabilities. With more advanced medical knowledge, we can take better care of those afflicted with illnesses like cancer which is one of the leading causes of death in Singapore.

Earlier this week, I was introduced to some of the cutting-edge cancer research being undertaken by the Cancer Science Institute of Singapore ([CSI Singapore](#)). Professor Ashok Venkitaraman and his team are doing good work 'CSI-ing' the behaviour of different cancer cells and how they respond to treatment. In addition, they are tapping on technology and automation to pursue novel areas of research with tremendous potential. I was also happy to meet young PhD students who shared fascinating stories on what inspired them to take an interest in a complex field like cancer research.

I look forward to the team at CSI Singapore unlocking new frontiers in cancer research, and translating research outcomes into real-world clinical applications, in the years ahead!





## A. CSI GRADUATE PROGRAM

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CSI Singapore is home to a global team of renowned basic and clinician scientists working collaboratively to understand causes of cancer to improve its detection, treatment, and prevention. CSI Singapore endeavors to revolutionise the landscape of biomedical research and position Singapore as a global leader. Our outstanding researchers and exceptional facilities create an energetic environment for ground-breaking science and world-class training.

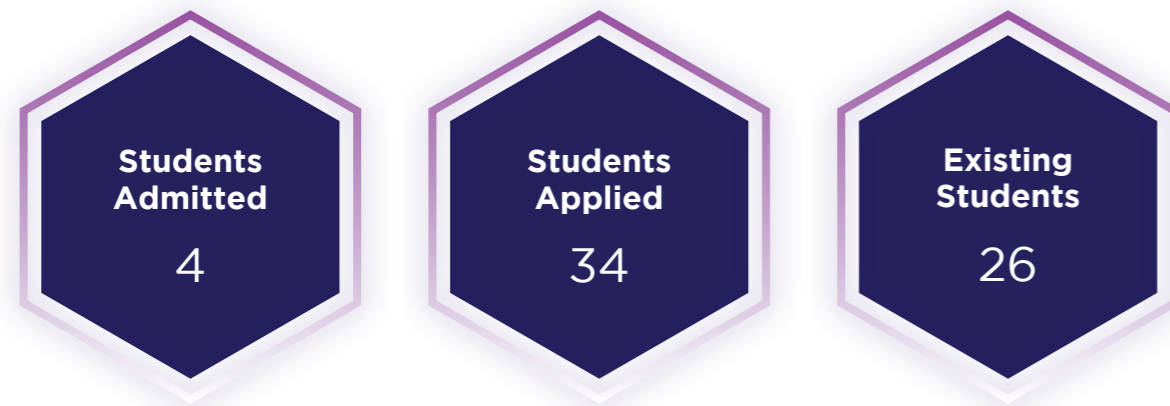
As part of a broader national mission to educate and train the next generation of scientists in a translational and multidisciplinary environment, CSI Singapore has developed its Cancer Biology Graduate Programme, hosted under the National University of Singapore's Yong Loo Lin School of Medicine. The institute conducts a multi-faceted and coordinated approach to cancer research, extending from basic mechanistic studies to experimental therapeutics.

Graduate students will have the opportunity to conduct cutting-edge research in modern experimental and bioinformatic labs with access to world-class facilities dedicated to cancer research and can look forward to working with a dynamic global team of renowned scientists in an intellectually stimulating environment. The Cancer Biology Graduate Programme is a 4-year programme which requires students to fulfil both coursework and research work leading to a PhD research thesis within their candidature period. This programme aims to equip students with the skills, knowledge, and experiences necessary to excel and become leaders in the field of cancer research. Comprehensive training - unique graduate courses and activities, are tailored to develop and train students throughout and beyond their PhD degree.

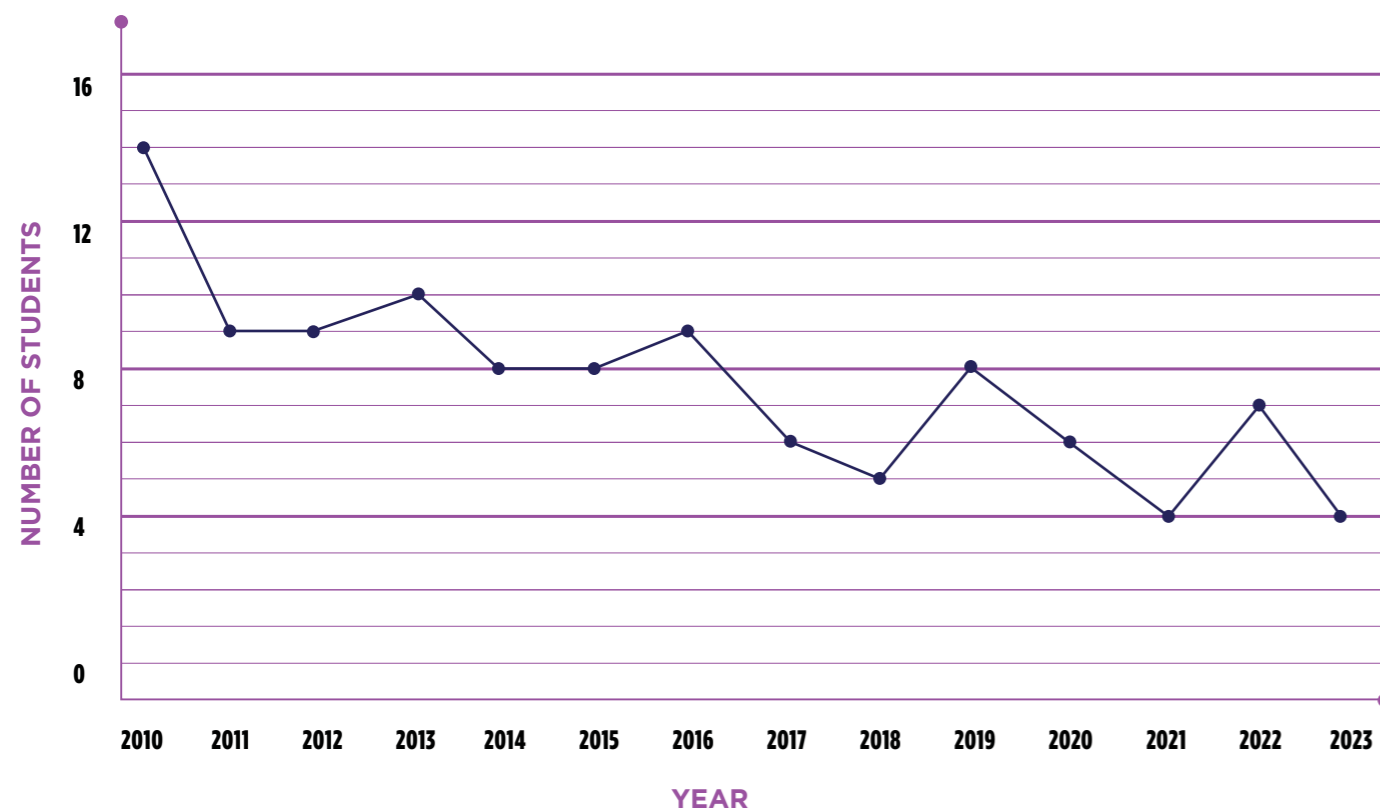
Our graduates have moved on to a variety of opportunities after their PhD studies. Many have taken up academic positions at various world-renowned institutions.



## CSI GRADUATE PROGRAM 2023



## STUDENTS ADMITTED 2010-2023



## JOURNEY SNAPSHOTS



### CHARLIE MARVALIM

#### Brief introduction about yourself

I am Charlie, currently a final year PhD student from CSI Singapore. I am from Indonesia and have been pursuing my education in Singapore since secondary school.

#### Why are you interested in pursuing cancer research?

While interning at National Cancer Centre Singapore during my polytechnic days, my passion for research grew because I can see how the research I was doing may provide information (e.g. mechanism of action) to a clinical trial they were conducting back then. Why cancer then? It is known that cancer is a debilitating disease and the number 1 cause of mortality in Singapore. Due to Singapore's ageing population, the incidence rate of cancer will continue to rise. Additionally, there are numerous intricate pathways utilized by cancer cells, not to mention factoring in the heterogeneous cancer cell population within an individual, as well as between individuals within a population. There is still a lot of work to be done to understand the mechanisms for which a cancer cell partakes and to identify optimal therapies to treat it.

#### What have you enjoyed the most in your PhD journey?

I really enjoy going for conferences and attending seminars/talks. As important as it is to focus on churning out new data for my thesis project, it is also good to take a step back and understand what other people are working on and their perspectives on cancer. After all, cancer research itself is a broad topic and requires a holistic overview from different fields to better understand this complex disease.

#### What is one challenge you have faced in your PhD journey, and how did you overcome it?

Definitely trying to introduce a knock-in mutation to generate an isogenic cell line using CRISPR. Currently, the efficiency of introducing knock-in mutations is incredibly low. In addition, it is a very laborious process as one has to isolate single cell colonies and expand them before genotyping to verify if the knock-in is successful. After more than 4 months of attempts and more than 300 single cell colonies, I was unsuccessful in introducing any successful knock-ins. Given the limited amount of time before thesis submission, I had to find other means of generating an isogenic cell line pair. Thankfully, I was introduced to the lentivirus system to generate a stable cell line expressing the mutation-of-interest.

**What is the quirkiest or most surprising fact/experience during your PhD journey?**

Sorting antibody catalogues in alphabetical order will save you a LOT of time. Also, not sure this applies to others but adherent cells tend to dislodge from culture plates after replacement of a culture medium that is warmed to 37 degrees celsius. This is not observed if the culture medium is at room temperature and is independent of the speed/force of dispensing.

**If you could have any superpower to aid your research, what would it be and why?**

To be able to manipulate time or at least slow it down. I have less than 1 year to wrap everything up, but there are still so many things I have yet to do. Besides, all that incubation time in between experiments or waiting for the cells to grow can easily be fast-forwarded.

**If your PhD journey had a theme song, what would it be and why?**

The Climb by Miley Cyrus. Pursuing a PhD is certainly a journey, sometimes there are obstacles along the way, sometimes there are roadblocks that force me to switch direction, but as long as we continue to persevere, we will eventually reach our destination. I guess this song also acts as a reminder to enjoy the journey as it won't last forever. There are and will always be more mountains to climb even after I graduate, but for now, I just have to focus on this one.



**JUDY SHAO**

**Brief introduction about yourself**

I'm Judy, I'm a fourth year PhD student under Dr. Polly Chen and Dr. Takaomi Sanda. I'm currently working on dysregulation of transcription factors in T cell malignancies.

**Why are you interested in pursuing cancer research?**

Cancer is the one of the top causes of death worldwide and there is no effective strategy to treat most types of cancers due to intra- and inter-tumor heterogeneity. I wanted to pursue cancer research because I am very curious to understand more about the molecular pathogenesis of cancer.

**What have you enjoyed the most in your PhD journey?**

I've quite enjoyed the flexible working hours. The freedom to plan my work to my schedule makes work a lot less taxing.

**What is one challenge you have faced in your PhD journey, and how did you overcome it?**

I had a particularly difficult time generating a homozygous clone that is absolutely necessary for my project. There was no easy solution; it just took a year of repeating the same thing and checking hundreds of clones over and over again to eventually get it.

**If you could have any superpower to aid your research, what would it be and why?**

I would definitely want the superpower to make all experiments work, because PhD is just 99% failing experiments and it gets quite tiring at times.



**JESSICA ALICE**

**Brief introduction about yourself**

My name is Jessica and I am a 4th Year PhD student in Dr. Tam Wai Leong's lab, working on the relationship between EMT and metabolism in Breast Cancer.

**Why are you interested in pursuing cancer research?**

I find it interesting to unravel the different ways in which cancer cells adapt to survive, proliferate and invade and how we can target these processes to develop novel therapeutics with the potential to help patients. A career in cancer research allows me to combine lab and computer work to contribute towards an exciting and important field.

**What have you enjoyed the most in your PhD journey?**

I have enjoyed the opportunity to work on my project independently but mostly being able to work alongside lab mates as part of a team in a fun and friendly environment.

**What is one challenge you have faced in your PhD journey, and how did you overcome it?**

My project led me to identify a post-translational modification that is not frequently researched. It has resulted in the need to think of more creative ways to study this modification without the typical reagents and assays that are available for most other post-translational modifications.

**If you could have any superpower to aid your research, what would it be and why?**

The ability to fast forward incubation times.

## CSI GRADUATE PROGRAM 2023



### ALLISON SI-YU CHAN

**Main Supervisor** Dr. Anand Jeyasekharan  
**Thesis Title** Targeting DNA Damage Response Kinases to Improve Chemotherapy Efficacy in Diffuse Large B-Cell Lymphoma



### GOH YA HWEЕ JASMINE

**Main Supervisor** A/Prof. Edward Chow  
**Thesis Title** Rational Design of Optimised Therapeutics Against Relapsed/Refractory Nonhodgkin Lymphoma



### ALEXIA CHARLINE HILLAIRET

**Main Supervisor** Dr. Dennis Kappei  
**Thesis Title** Functional Characterisation of Hot1 in Alt Telemore Homeotasis



### KIM HYOJU

**Main Supervisor** A/Prof. Takaomi Sanda  
**Co-supervisor** Prof. Toshio Suda  
**Thesis Title** Roles of SWI/SNF Complex in T-Cell Acute Lymphoblastic Leukemia

## A. AWARDS & HONOURS



**Tam Wai Leong**  
**Associate Professor, NUS**  
**Deputy Executive Director**  
Genome Institute of Singapore, A\*STAR



**Takaomi Sanda**  
**Associate Professor**  
**Graduate Mentor of the Year Award**  
*Division of Graduate Studies, NUS YLLSoM*



**Low Jun Siong**  
**Assistant Professor**  
**NRF Fellowship**  
*National Research Foundation*



**Koh Mun Yee**  
**PhD Student**  
**Young Investigator Award**  
*International Myeloma Society*



**Goh Boon Cher**  
**Professor**  
**Distinguished Senior Clinician Award 2023**  
*Ministry of Health*



**Irfan Azaman**  
**PhD Student**  
**ASH Abstract Achievement Award**  
*American Society of Hematology*



## A. RESEARCH MEETINGS

Date	Speakers	Title
13 January 2023	Vincent Oei (PhD Student)	RUNX3 Directly Targets MYC Stability to Suppress Tumorigenesis
	Dr. Sharmaine Ho (Research Fellow)	Enhancer Profiling of Mesenchymal-type Gastric Cancer Reveals Subtype-Specific Epigenomic Landscapes and Targetable Vulnerabilities
	Larry Ng (PhD Student)	DDX6 - A Potent A-to-I RNA Editing Repressor and an Immune Suppressor
27 January 2023	Dr. Anders Skanderup (Associate Investigator)	Accurate Somatic Variant Detection using Weakly Supervised Deep Learning
	Dr. Shyam Prabhakar (Associate Investigator)	Single cell and Spatial Omics for Cancer Stratification and Biomarker Discovery
10 February 2023	Dr. Thuya Win Lwin (Research Fellow)	Investigating the Oncogenic Role of AKR1C3 in Lung Squamous Cell Carcinoma
	Dr. Bibek Dut (Research Fellow)	Phase Separation by FUS and RUNX1 Maintains Cellular Integrity in Hematopoietic Stem Cells and Lymphoid Progenitors
	Jeremiah Suryatenggara (PhD Student)	ChIP-AP - An Integrated Analysis Pipeline for Unbiased ChIP seq Analysis
24 February 2023	Dr. Christabella Adine (Research Fellow)	Making In Vitro Tumor Models Whole Again Understanding the Roles of EBV miRNAs in
	Fan Shuangyi (Research Assistant)	Extranodal Natural Killer/T-cell Lymphoma Tumorigenesis
10 March 2023	Dr. Salma Awad Mahmoud (Senior Research Fellow)	Characterization of RUNX3 as Novel Modulator of Chromatin Dynamics In Metastatic Cancer
	Dr. Neslihan Kaya (Research Fellow)	Insights into HCC Recurrence through Genomic Analysis of Matched Primary and Secondary Tumors
	Dr. Shen Haoqing (Research Fellow)	Mitochondria-associated Double-stranded RNA Sensing and Innate Immunity: Mechanistic Investigation and Therapeutic Implication

## A. RESEARCH MEETINGS

Date	Speakers	Title
<b>14 April 2023</b>	Wang Weijie (PhD Student)	Identification of an Effective Ribonucleoside Analogue and Immunomodulatory Imide Drug (IMiD) Combination for Multiple Myeloma
	Kim Hyoju (PhD Student)	The Roles of SWI/SNF Complex in T-ALL
	Dr. Junichi Matsuo (Senior Research Fellow)	Potential Role of IQGAP3 in Normal Stomach Tissue Repair and Gastric Cancer Development
<b>12 May 2023</b>	Ng Seow Qi (PhD Student)	In Vivo CRISPR Screen to Identify Metabolic Vulnerabilities in Cancer
	Dr. Chung Tae-Hoon (Senior Research Fellow)	Genomic characterization of functional high-risk multiple myeloma patients
	Hannan Wong Hau Shen (PhD Student)	Understanding the origins and consequences of genomic instability in breast cancer
<b>26 May 2023</b>	Dr. Clare Jelinska (Senior Research Scientist)	The Role of DSS1 as a Folding Chaperone in Cancer-causing BRCA2 Mutations
	Qiu Shiwen (PhD Student)	Folate Receptor Alpha as a Novel Biomarker and a Potential Target for Nasopharyngeal Carcinoma
	Lee Rui Xue (PhD Student)	Identifying Drug Combinations that Enhance the Anti-tumour Activity of a Novel BAFF-R Monoclonal Antibody in DLBCL
<b>23 June 2023</b>	Dr. Joline Lim (Joint Fellow)	Overcoming Endocrine Resistance in Hormone Receptor Positive Breast Cancer
	Liu Min (PhD Student)	Spatially-resolved Transcriptomics Reveal Macrophage Heterogeneity and Prognostic Significance in Diffuse Large B-cell Lymphoma
	Dr. Huang Kie Kyon (Senior Research Fellow)	Spatiotemporal Genomic Profiling of Intestinal Metaplasia Reveals Clonal Dynamics of Gastric Cancer Progression

## A. RESEARCH MEETINGS

Date	Speakers	Title
<b>14 July 2023</b>	Dr. Mitsuhiro Shimura (Research Scientist)	IQGAP3 Signaling Mediates Intra-tumoral Functional Heterogeneity to Enhance Malignant Growth
	Felix Blanc (PhD Student)	Biomarkers of Chemoresistance in High-Grade Ovarian Cancer, Clinical Relevance of CCNE1 Amplifications and TERT Promoter Mutations
<b>28 July 2023</b>	Noor Rashidha Bte Meera Sahib (PhD Student)	Development of a High-throughput Flow Cytometry Immunophenotyping Drug Densitivy Platform (FCI-QPOP)
	Victor Tong (PhD Student)	Mapping the RNA-binding Protein Landscape in Colorectal Cancer
	Dr. Stephen Chong (Visiting Postdoctoral Fellow)	Targeting BCL2 Family Protein Phosphorylation in Venetoclax Resistant Lymphoid Malignancies
<b>11 August 2023</b>	Goh Wei Liang (PhD Student)	A Balancing Act of the RNA Editing Enzyme ADAR1 in the Liver: Immune Sensing and Immunosuppression
	Dr. Reinhard Brunmeir (Research Scientist)	EZH2-Mediated Splicing Dysregulation in CML
	Dr. Elayanambi Sundaramoorthy (Research Scientist)	Screening for Metabolomic Perturbations that Result in Functional BRCA2 Loss
<b>08 September 2023</b>	Dr. Lee May Yin (Senior Research Scientist)	Mitochondrial Phospholipid Remodeling Potentiates Breast Cancer Metastasis
	Dr. Raghav Sundar (Asst. Prof)	Dissecting the Tumor Microenvironment and Metastatic Niche of Gastric Cancer Peritoneal Metastases
	Lycia Tan (PhD Student)	Investigating the Impact of ZNF143 Deletion on Chromatin Structure Dysregulation in Murine Liver Development and Hepatocellular Carcinoma

## A. RESEARCH MEETINGS

Date	Speakers	Title
22 September 2023	Irfan Azaman (PhD Student)	Extracellular Vesicles Secreted from Daratumumab Resistant Cells Promote Resistance and Proliferation of Daratumumab Sensitive cells, possibly Through the Transfer of miRNA Cargo
	Bryan Ng (PhD Student)	Exploring Novel Isoforms of RNA Editing Enzyme ADAR1: Functional Characteristics and Therapeutic Potential
	Clarissa Toh (PhD Student)	Investigating C11ORF68 as a Potential Modulator of the DNA Damage Response
06 October 2023	Dr. Grishma Rane (Research Fellow)	ZBTB48 Is A Pioneer Factor Regulating B-cell-specific CIITA Expression
	Dr. Govinda Lenka (Research Fellow)	Identification of novel biomarkers and therapeutic targets for the treatment of Nasopharyngeal Carcinoma
20 October 2023	Prof. Yang Zhang (Senior Principal Investigator)	Toward the Solution of the Protein Structure Prediction Problem
	Dr. Joe Yeong (Associate Investigator)	Spatial Tech to the Clinic, How Close are We? – A 10 Years Singapore Odyssey to Share

## B. DISTINGUISHED SPEAKERS' SERIES



**Prof. A. Thomas Look**  
2 February 2023, Thursday  
Dana Farber Cancer Institute at  
Harvard Medical School  
*Transcriptional Circuits Drive  
Isotretinoin-induced Differentiation and  
Genetic Predisposition in Neuroblastoma*



**Dr. Andre Nussenzweig**  
28 February 2023, Tuesday  
Laboratory of Genome Integrity (LGI),  
National Cancer Institute (NCI) at  
National Institutes of Health  
*Neuronal Genome Integrity*



**Prof. Lynne Maquat**  
5 June 2023, Monday  
Center for RNA Biology at  
University of Rochester  
*Nonsense-mediated mRNA Decay  
in Human Health and Disease*



**Prof. Steven T. Rosen**  
23 October 2023, Monday  
Beckman Research Institute and  
City of Hope's Cancer Center  
*Application of Bi-Specific Monoclonal  
Antibodies for the Treatment of  
Non-Hodgkin's Lymphomas*



## C. SEMINARS



**Dr. Shunqing Liang**  
30 January 2023, Monday  
University of Massachusetts  
*Application of CRISPR-mediated  
Genome Editing for Cancer Research*



**Dr. Emmanuel Barillot**  
17 July 2023, Monday  
Institut Curie  
*Modeling Tumors at  
Single Cell Level*



**Prof. Shuming Song**  
20 July 2023, Thursday  
The University of Texas  
MD Anderson Cancer Center  
*Novel Targets and Target Strategies  
for Gastroesophageal Cancer  
Progression and Metastasis*



**A/Prof. Fereydoun  
Hormozdiari**  
6 September 2023, Wednesday  
University of California, Davis  
*Computational and Machine Learning  
Approaches in Genomics and Early  
Prediction of Cancer*



**A/Prof. Robert Welner**  
21 September 2023, Thursday  
University of Alabama at Birmingham  
*Active Signaling in Native  
Single-Cell States*



**A/Prof. Florian Karreth**  
26 October 2023, Thursday  
Moffitt Cancer Center  
*Melanoma Suppression by PTEN*



**A/Prof. Gina DeNicola**  
26 October 2023, Thursday  
Moffitt Cancer Center  
*Nrf2 and Cysteine  
Metabolism in Cancer*

## D. CONFERENCES AND SYMPOSIUMS

### CSI Singapore – IIT Madras Virtual Joint Symposium (13 February 2023)

Register at: <https://bit.ly/3wsDaqt>

**Save The Date  
13 Feb 2023**

**CSI Singapore –  
IIT Madras  
Virtual Joint Symposium**

12.30pm - 6pm (Singapore time) | 10am-3.30pm (Chennai Time)

This symposium aims to foster the exchange of scientific ideas and facilitate collaborations between CSI Singapore and IIT Madras scientists.

Jointly organized by the Cancer Science Institute of Singapore (CSI Singapore) and IIT Madras A total of 78 participants from both institutes presented their high-quality research on the virtual platform, which served as an excellent medium for discussions and exchange of scientific knowledge and ideas between speakers and attendees. Attendees were engaged by the robust scientific debate and intellectually stimulating talks, where presenters shared their research findings in an insightful and concise manner.

The major goal of this collaboration is for (a) the exchange of scientific, academic, and technical information and academic materials of mutual interest; (b) the identification of opportunities for exchanges and cooperation and joint research and development in disciplines of mutual interest; (c) the organization of and participation in Joint academic and scientific activities such as seminars, workshops and international conferences;



**STEP Ahead Into An RNA World 2023 (29 -30 May 2023)**

# STEP Ahead Into An RNA World 2023

29th - 30th May 2023 - 9:30 AM (GMT +08)

SINGAPORE. UTown Auditorium 2,  
National University of Singapore

## FEATURED SPEAKERS



**KRISTIAN BAKER**  
CEO  
RNA Society



**ASHOK VENKITARAMAN**  
Director  
CSI, NUS



**SUN LEI**  
Associate Professor  
DUKE-NUS



**XAVIER ROCA**  
Associate Professor  
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**WAN YUE**  
Group Leader  
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\*Applications will be accepted on a first-come, first-served basis.  
\*Pre-requisite: Registered for the 28th Annual Meeting of the RNA Society (RNA 2023).



Yong Loo Lin  
School of Medicine



Sponsored by



**Single-Cell Res/volution 2023 (17-18 July 2023)**

**Single-Cell Res/volution 2023**  
jointly hosted by CSI Singapore and ENS, France

**DATE** 17 & 18 July 2023 (Monday & Tuesday)  
**TIME** 2pm - 6pm  
**VENUE** NUS Centre for Life Science (CeLS) Auditorium (Level 1)  
28 Medical Drive, Singapore 117456

**Keynote Speakers**

**SHYAM PRABHAKAR**  
GENOME INSTITUTE OF SINGAPORE, A\*STAR

**PATRICK TAN**  
CANCER SCIENCE INSTITUTE OF SINGAPORE, DUKE-NUS MEDICAL SCHOOL, SINGAPORE AND GENOME INSTITUTE OF SINGAPORE, A\*STAR

**Symposium Speakers**

**EMMANUEL BARRILLOT** (INSERM, FRANCE)  
**POLLY CHEN** (CANCER SCIENCE INSTITUTE OF SINGAPORE)  
**WEE JOO CHING** (CANCER SCIENCE INSTITUTE OF SINGAPORE, NATIONAL UNIVERSITY OF SINGAPORE)  
**LEILA PERE** (INSERM, FRANCE)

**TOSHIO SUDA** (CANCER SCIENCE INSTITUTE OF SINGAPORE)  
**YVONNE TAY** (CANCER SCIENCE INSTITUTE OF SINGAPORE)  
**CÉLINE VALLOT** (INSERM, FRANCE)

**Workshop Speakers**

**TOUATI BENOUKRAF** (MEMORIAL UNIVERSITY OF HERIQUANNE, CANCER SCIENCE INSTITUTE OF SINGAPORE)  
**DENIS THIEFFRY** (ECOLE NORMALE SUPÉRIEURE, FRANCE)  
**LOREDANA MARTIGNETTI** (INSERM, FRANCE)

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Single-Cell Res/volution 2023 jointly organized by CSI Singapore/NUS Singapore, and ENS/PSL, France

Cancer is a leading cause of death worldwide, accounting for “~10” million deaths in 2020 (source: WHO). The number of cases increases as the population ages in regions such as Europe and Southeast Asia. It is a public health priority to tackle this burden, by developing better prognostic and therapeutic tools.

The past decades have greatly increased our knowledge of cancer biology. In particular, recent advances in single cell sequencing technologies uncovered new findings which were not previously able to be detected by conventional techniques. Over the past few years, many significant insights were provided into various areas of cancer research, including tumor microenvironment, tumor heterogeneity, cancer plasticity and cancer stem cells, as well as into immunology and developmental biology.

To further advance our understanding on cancers and in other biological fields, it is critical to develop bioinformatics techniques and apply the single cell sequencing technology into new areas.

The core objective of the **Single-Cell Res/volution 2023, jointly hosted by CSI Singapore and ENS, France**, is to bring together outstanding researchers in the field of single cell technologies and bioinformatics from Singapore and France for the exchange of ideas and information.

Beyond our own existing scientific collaborations, we hope to spark new interactions between scientists from Singapore and France, and to provide an excellent platform for learning and the exchange of ideas.



Single-Cell Res/volution 2023 (17-18 July 2023)

## NUS - Kanagawa Symposium 2023 Advances in Cancer Research

**DATE** 4 - 5 September 2023 (Monday & Tuesday)  
**VENUE** NUS Centre for Life Science (CeLS) Auditorium (Level 1)

**Opening Address**

**Professor Yohei MIYAGI**  
Professor and Director,  
Cancer Molecular Pathology & Genetics Division,  
Kanagawa Cancer Center Research Institute

**Professor Wee Joo CHNG**  
Professor & Vice-Dean (Research), Yong Loo Lin School of Medicine, NUS  
Group Director of Research, National University Health System  
Senior Principal Investigator, Cancer Science Institute of Singapore, NUS  
Executive Director, Singapore Translational Cancer Consortium

**Closing Address**

**Professor John Eu-Li WONG**  
Isabel Chan Professor in Medical Sciences  
Executive Director, Centre for Population Health  
National University of Singapore  
Senior Advisor  
National University Health System

**Focus Topics**

- Onco-Immunology
- Aging
- RNA biology
- Genomics

**Speakers**

<b>National University of Singapore</b>	<b>Yokohama City University</b>	<b>Central Institute for Experimental Animals</b>
<b>Polly Leilei CHEN</b> Associate Professor	<b>Hisashi HASUMI</b> Associate Professor	<b>Teja CELHAR</b> Senior Research Scientist
<b>Wee Joo CHNG</b> Professor	<b>Hideaki NAKAJIMA</b> Professor	<b>Makoto SUEMATSU</b> Director
<b>Dennis KAPPEI</b> Assistant Professor	<b>Tomohiko TAMURA</b> Professor	<b>Takeshi TAKAHASHI</b> Central Manager
<b>Anthony KHONG</b> Assistant Professor	<b>Kensuke TATEISHI</b> Associate Professor	<b>Kanagawa Cancer Center</b>
<b>Derrick ONG</b> Assistant Professor	<b>Jordan RAMILOWSKI</b> Associate Professor	<b>Shiro KOIZUME</b> Associate Chief Scientist
<b>ONG Sin Tiong</b> Associate Professor		<b>Hiroto NARIMATSU</b> Division Chief
<b>Patrick TAN</b> Professor		<b>Tetsuro SASADA</b> Division Chief
		<b>Shinya SATO</b> Section Chief

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**Logos:** NUS, NUS Centre for Cancer Research, CSi, YLLSoM, YOKOHAMA CITY UNIVERSITY, CIEA, 神奈川県

The Cancer Science Institute of Singapore and the NUS Centre for Cancer Research (N2CR) jointly organised the NUS-Kanagawa Advances in Cancer Research Symposium in collaboration with Kanagawa Cancer Center Research Institute, Yokohama City University School of Medicine and the Kanagawa Prefectural Government.

The NUS-Kanagawa Cancer Symposium 2023 aims to present cutting edge research focusing on onco-immunology, RNA biology, genomics and ageing. Through this symposium, we hoped to bring together leading researchers and students from NUS, the Kanagawa Cancer Center and the Yokohama City University, as well as government and industry representatives, with the aim of fostering greater collaboration in cancer-related fields across Singapore and Japan.

Frontiers in Cancer Science 2023 (6-8 November 2023)

## 6 - 8 NOV 2023 University Cultural Centre National University of Singapore

# FRONTIERS IN CANCER SCIENCE 2023

**15<sup>th</sup> ANNUAL CONFERENCE**  
Converging the latest cancer discoveries around the world, FCS 2023 promises ground-breaking and innovative insights into cancer research! Join us and learn from the foremost cancer experts as they share their new findings.  
csi.nus.edu.sg/FCS

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Cancer Science Institute of Singapore (Chair)

**EXECUTIVE COMMITTEE**  
Polly Leilei CHEN  
Cancer Science Institute of Singapore  
Joanne NGEOW  
Lee Kong Chian School of Medicine  
Sharif PERVAIZ  
Yong Loo Lin School of Medicine,  
National University of Singapore  
Kanaga SABAPATHY  
National Cancer Centre Singapore  
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Anders SKANDERUP  
Genome Institute of Singapore, A\*STAR  
Sunny WONG  
Lee Kong Chian School of Medicine

**SPEAKERS FOR SCIENTIFIC TALKS**

<b>Andrea ABLASSER</b> Ecole Polytechnique Fédérale de Lausanne, Switzerland	<b>Babita MADAN</b> Duke-NUS Medical School, Singapore
<b>Shelley BERGER</b> University of Pennsylvania, US	<b>Manolis PASPARAKIS</b> University of Cologne, Germany
<b>Tom James CARNEY</b> Lee Kong Chian School of Medicine, Singapore	<b>Shahab PERVAIZ</b> National University of Singapore
<b>Polly Leilei CHEN</b> Cancer Science Institute of Singapore	<b>Bin Tean TEH</b> National Cancer Centre Singapore
<b>Sanjay DE MEL</b> National University Cancer Institute Singapore	<b>Michel TREMBLAY</b> McGill University, Canada
<b>Scott DIXON</b> Stanford University, US	<b>Karen VOUSDEN</b> The Francis Crick Institute, UK
<b>Christian HACKENBERGER</b> FHP Berlin, Germany	<b>Mel WANG-CASEY</b> Duke-NUS Medical School, Singapore
<b>Mien-Chie HUNG</b> China Medical University, Taiwan	<b>Chuan YAN</b> Institute of Molecular and Cell Biology, Singapore
<b>Anand JEYASEKHARAN</b> Cancer Science Institute of Singapore & National University Cancer Institute Singapore	<b>Timothy YAP</b> MD Anderson Cancer Center, US
<b>Thirumala-Devi KANNEGANTI</b> St. Jude Children's Research Hospital, US	<b>Lee ZOU</b> Duke University School of Medicine, US
<b>Calvin KUO</b> Stanford University, US	<b>Speakers</b>
<b>Thi Nguyen Minh LE</b> National University of Singapore	<b>Scott DIXON</b> Stanford University, US
<b>Jianjun LIU</b> Genome Institute of Singapore	<b>Mien-Chie HUNG</b> China Medical University, Taiwan
<b>Stephanie MA</b> The University of Hong Kong, Hong Kong	<b>Ashok VENKITARAMAN</b> Cancer Science Institute of Singapore

**AACR - FCS EDUCATION SESSION**

**Logos:** CSI, NUS, Duke-NUS, A\*STAR, NCCS, NCIS, YLLSoM, AACR

Singapore held its 15th Frontiers in Cancer Science (FCS) conference from November 6th- 8th 2023, at the University Cultural Centre, National University of Singapore. This annual conference started in 2009 as a one-day symposium dedicated to the purpose of stimulating the growth of the regional community of cancer researchers, and their links with international colleagues. Since its inception, FCS has grown into a major international cancer conference in the Asia-Pacific region, and the largest of its kind in Singapore, with over 500 participants registering annually. Since 2020, we have partnered with AACR to concurrently hold the **AACR-FCS Education Sessions**, the first of their kind in Southeast Asia.

FCS 2023 brought together a stellar list of international and regional speakers covering many current trends in cancer research, spanning basic science and clinical research. Young investigators had an opportunity to showcase their work as posters, and talks selected from outstanding poster abstracts were presented at the Oral Abstract Speaker sessions.

Prizes for the best posters included two travel awards (each worth US\$2,500) to support travel to the AACR Annual Meeting in 2024. This year, we were also pleased to announce that 'Outstanding FCS Abstract Travel Awards' were given out to selected abstracts from international participants to help cover their expenses for attendance at FCS.

The **AACR-FCS Education Sessions**, initiated in 2020, have enjoyed a high level of participation and positive feedback from FCS participants. These sessions aim to provide graduate students, post-doctoral researchers and early-career basic or clinical investigators with a broader view of key topics in contemporary cancer research, presented by international opinion leaders. At FCS 2023, the AACR-FCS Education Sessions included presentations from Scott Dixon (Stanford University), Mien-Chie Hung (China Medical University) and Ashok Venkitaraman, CSI Singapore's Director.

FCS is jointly organized by the Cancer Science Institute of Singapore (CSI Singapore), Duke-NUS Medical School (Duke-NUS), Genome Institute of Singapore (GIS), Institute of Molecular and Cell Biology (IMCB), Lee Kong Chian School of Medicine (LKC Medicine), National Cancer Centre Singapore (NCCS), National University Cancer Institute, Singapore (NCIS) and Yong Loo Lin School of Medicine, NUS (YLLSoM).



## PUBLICATIONS

Authors	Title	Journal	Vol/Page	Date
Chong Yang, <b>Toshio Suda</b>	[Review] Revisiting PD-1 to target leukaemic stem cells	Nat Cell Biol	25(1):17-19	Jan-23
Win Lwin Thuya, Li Ren Kong, Nicholas L Syn, Ling-Wen Ding, Esther Sok Hwee Cheow, Regina Tong Xin Wong, Tingting Wang, Robby Miguel Wen-Jing Goh, Hongyan Song, Migara K Jayasinghe, Minh Tn Le, Jian Cheng Hu, <b>Wei-Peng Yong</b> , <b>Soo-Chin Lee</b> , <b>Andrea Li-Ann Wong</b> , Gautam Sethi, Huynh The Hung, Paul Chi-Lui Ho, Jean-Paul Thiery, Siu Kwan Sze, Tiannan Guo, Ross A Soo, Henry Yang, Yaw Chyn Lim, Lingzhi Wang, <b>Boon-Cher Goh</b>	[Meta-Analysis] FAM3C in circulating tumor-derived extracellular vesicles promotes non-small cell lung cancer growth in secondary sites	Theranostics	13(2):621-638	Jan-23
Je Lin Sieow, Hweixian Leong Penny, Sin Yee Gun, Ling Qiao Tan, Kaibo Duan, <b>Joe Poh Sheng Yeong</b> , Angela Pang, Diana Lim, Han Chong Toh, Tony Kiat Hon Lim, Edgar Engleman, Olaf Rotzschke, Lai Guan Ng, Jinmiao Chen, Suet Mien Tan, and Siew Cheng Wong	Conditional Knockout of Hypoxia-Inducible Factor 1-Alpha in Tumor-Infiltrating Neutrophils Protects against Pancreatic Ductal Adenocarcinoma	Int J Mol Sci	24(1):753	Jan-23
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Vo Duy Long, Dang Quang Thong, Nguyen Viet Hai, Tran Quang Dat, Ho Le Minh Quoc, Doan Thuy Nguyen, Nguyen Vu Tuan Anh, Tran Anh Minh, Nguyen Lam Vuong, <b>Jimmy Bok-Yan So</b> , Nguyen Hoang Bac, Ichiro Uyama	Surgical outcomes and quality of life assessment of esophagectomy for cancer with colon conduit via retrosternal route	Esophagus	Online ahead of print	Jan-23
<b>Wee-Joo Chng</b> , Sagar Lonial, Gareth J. Morgan, Shinsuke Iida, Philippe Moreau, Shaji K. Kumar, Philip Twumasi-Ankrah, Miguel Villarreal, Ajeeta B. Dash, Alexander Vorog, Xiaoquan Zhang, Kaveri Suryanarayan, Richard Labotka, Meletios A. Dimopoulos & S. Vincent Rajkumar	[Meta-Analysis] A pooled analysis of outcomes according to cytogenetic abnormalities in patients receiving ixazomib- vs placebo-based therapy for multiple myeloma	Blood Cancer J.	13(1):14	Jan-23
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Wei Liu, Xu Liao, Ziye Luo, Yi Yang, Mai Chan Lau, Yuling Jiao, Xingjie Shi, Weiwei Zhai, Hongkai Ji, <b>Joe Yeong</b> , Jin Liu	Probabilistic embedding, clustering, and alignment for integrating spatial transcriptomics data with PRECAST	Nat Commun	14(1):296	Jan-23

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Yeh SC, Cheong FJF, <b>Tay Y</b>	Circular RNAs and Untranslated Regions in Acute Myeloid Leukemia	Int J Mol Sci.		Feb-23
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