CSI SINGAPORE

2024
ANNUAL REPORT

CONTENTS

Introduction

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2024 – An ‘Eventful’ Year!

The past year has been a transformative period for Cancer Science Institute of Singapore (CSI Singapore), driven by cutting-edge discoveries, collaborative initiatives, and a shared commitment to address the most pressing challenges in cancer research. It has been a thrilling and truly eventful year. CSI Singapore has been embarking on ground-breaking collaborations with local and global partners, with numerous joint meetings. At the heart of this progress were many joint meetings, of note the EMBO Workshop on “Chromatin Biology in Cancer”, which brought together leading minds in the field of epigenetics, to catalyze new partnerships and accelerate breakthroughs. Such meetings served as a testament to the power of collaboration in driving impactful research and delivering tangible results in advancing worldwide understanding of the role of epigenetics in cancer.

Our researchers and partners have made significant strides in the fight against cancer, demonstrating the value of integrated science, technology, and clinical expertise from diverse scientific disciplines. 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. To cite just a few examples, CSI Singapore scientists identified a long-elusive connection between dietary factors and elevated cancer susceptibility; leveraged cutting-edge technologies to explore the role of macrophages in lymphoma progression and immune response; and introduced a promising new treatment for T-cell leukaemia patients who have not responded to standard approaches – paving the way towards actionable pathways for prevention, personalized therapeutic strategies and most importantly provide renewed hope for improved outcomes and quality of life for cancer patients and their loved ones.

These achievements reflect the ethos of collaboration that defines our institute—where multidisciplinary teams come together to uncover solutions that were previously unimaginable. Through initiatives like joint meetings and sustained partnerships with national and global institutions, we remain steadfast in our mission to transform cancer research into life-saving realities.

As we bid farewell to another year, the World Health Organization (WHO) has issued a sobering projection: the number of new cancer cases is expected to rise to over 35 million by 2050—a 77% increase from 2022. This staggering statistic underscores the urgency of our mission.

At CSI Singapore, we are inspired by the momentum we have built this year and the opportunities that lie ahead. With relentless determination, we remain committed to pushing boundaries, nurturing innovation, and collaborating to transform cancer from a life-threatening disease into a manageable condition—and, ultimately, to a future where it is no longer a threat to human lives.

Together, we will continue to make strides towards a brighter, healthier tomorrow.

CSI Singapore

The Year in Numbers

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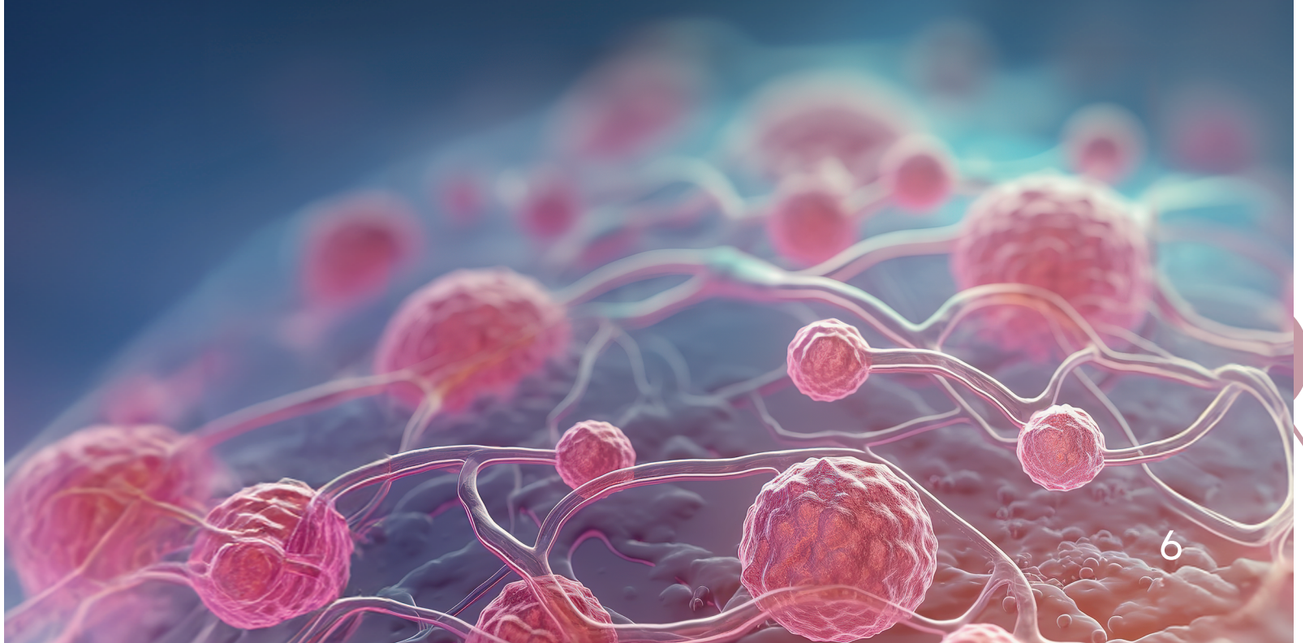
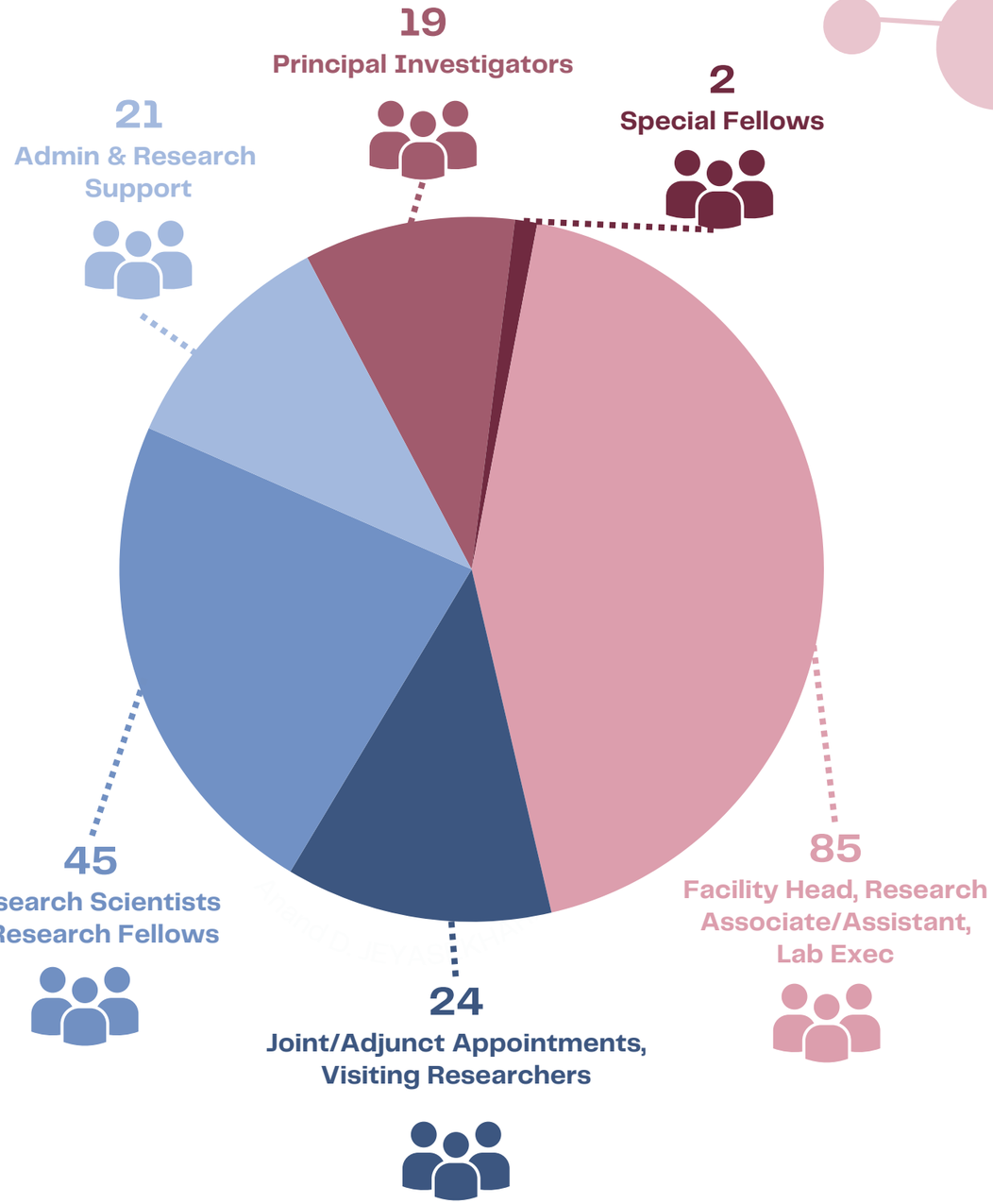


A. Core Facilities

- Genomics and Data Analytics Core (GeDaC)
- Fluorescence Activated Cell Sorting (FACS) Facility
- Microscopy and Multiplex Assays Core
- Quantitative Proteomics Core
- Transgenic and Gene Targeting Facility
- Leukemia Cell Bank

B. Staff Strength



C. Publication Highlights

132 Publications

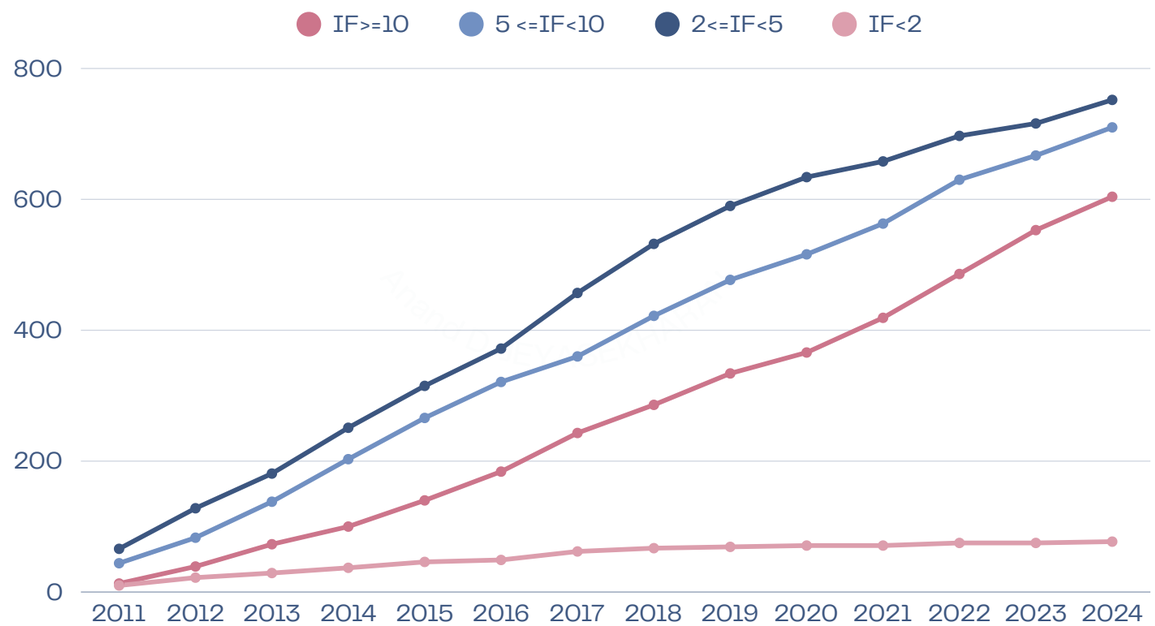
98 International Collaborations

65 Press Releases

64,332 Citations Received (2011-2024)

3 Highly Cited Papers

Cumulative Publications Based on IF Score



D. Collaboration Network

2024 Top Collaborators by Country

1. United States
2. China
3. Japan
4. United Kingdom
5. Italy
6. Germany
7. France
8. Taiwan
9. Canada
10. Netherlands

E. Local Collaboration

- NUS National University of Singapore
- Agency for Science, Technology and Research (A*STAR) SINGAPORE
- MOHH Making Our Healthcare Happen
- NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE
- National Cancer Centre Singapore SingHealth
- Singapore General Hospital SingHealth
- SingHealth *Defining Tomorrow's Medicine*
- Tan Tock Seng Hospital National Healthcare Group
- National Heart Centre Singapore SingHealth
- KK Women's and Children's Hospital SingHealth
- National Healthcare Group *Adding years of healthy life*
- Singapore National Eye Centre SingHealth
- National Centre for Infectious Diseases National Healthcare Group
- INSTITUTE of MENTAL HEALTH National Healthcare Group

The Year in Research

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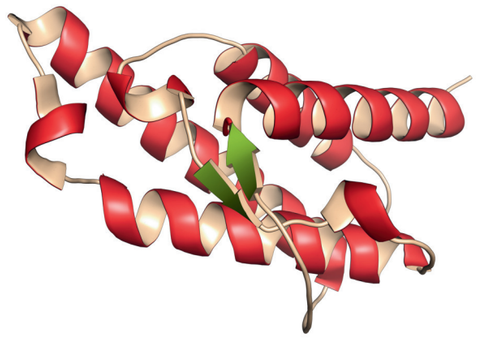
A. Selected Research Highlights in 2024

Aberrant Upregulation of RUNX3 Activates Developmental Genes to Drive Metastasis in Gastric Cancer (Jan 2024, Cancer Research Communications)

Gastric cancer is the fifth most diagnosed cancer and the third leading cause of cancer-related deaths due to its tendency to metastasize. **Prof. Yoshiaki Ito**, Senior Principal Investigator at CSI Singapore and his team have identified the RUNX3 protein as a key driver of this process. In gastric cancer cells, it was found that inhibiting RUNX3 reduces their ability to migrate, invade, and grow independently, which are crucial steps in metastasis. urther investigation revealed that RUNX3 directly upregulates metastasis-associated genes, including WNT5A, CD44, and VIM.

FRUNX3 binds directly to these genes, promoting their expression and thus aiding cancer spread. In particular, WNT5A was found to be one of the main effectors of RUNX3 in promoting metastasis. These findings suggest that an improved understanding of RUNX3 regulation of WNT5A will yield insights into the treatment of late-stage gastric cancer.

Improving Deep Learning Protein Monomer and Complex Structure Prediction Using DeepMSA2 with Huge Metagenomics Data (Jan 2024, Nature Methods)



A team led by **Prof. Yang Zhang**, Senior Principal Investigator at CSI Singapore, reports DeepMSA2, a new pipeline that significantly improves protein structure predictions through more advanced multiple-sequence alignments (MSAs) construction. Leveraging iterative alignment searches through genomic and metagenome sequence databases, DeepMSA2 excels in balancing alignment coverage and diversity, leading to more precise predictions of protein structures. DeepMSA2's integration with the AlphaFold2 modelling approach has shown remarkable improvements.

In large-scale tests, it achieved substantial gains in predicting complex protein structures, outperforming current state-of-the-art methods in the CASP15 experiment. By improving the accuracy of protein structure predictions, DeepMSA2 opens new avenues for understanding protein functions, interactions, and mechanisms, which are crucial for drug discovery and disease treatment.

Spatially-resolved Transcriptomics Reveal Macrophage Heterogeneity and Prognostic Significance in Diffuse Large B-cell Lymphoma (Mar 2024, Nature Communications)

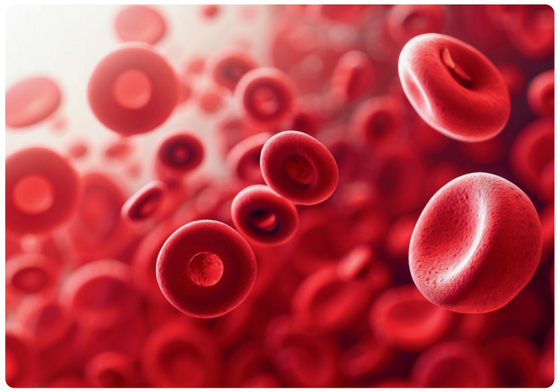
Led by **Asst. Prof. Anand Jeyasekharan**, Principal Investigator and Facility Head of Microscopy and Multiplex Assay (MMA) Core at CSI Singapore, his team provided new insights into the role of macrophages, which are immune cells abundantly present in the tumour microenvironment of diffuse large B-cell lymphoma (DLBCL). DLBCL is the most common subtype of non-Hodgkin lymphoma in adults, with a high relapse rate after initial treatment. By using advanced digital spatial profiling, the team identified six distinct macrophage signatures linked to specific regions within the tumour and patient outcomes. This highlights the importance of macrophages in the fight against lymphoma. Mapping these immune cells and understanding their specific roles within the tumour environment has provided a framework to further evaluate the biological and clinical relevance of macrophage subtypes in lymphoma.

A Glycolytic Metabolite Bypasses "Two-hit" Tumor Suppression by BRCA2 (Apr 2024, Cell)

Prof. Ashok Venkitaraman, Director of CSI Singapore, and **Dr. Li-Ren Kong**, Senior Research Scientist, led a team of researchers to uncover a novel mechanism by which the glycolytic metabolite methylglyoxal (MGO), a byproduct of glucose breakdown, can transiently disable the tumour-suppressing function of the BRCA2 protein. As such, individuals with high MGO levels— who have been found to be those with conditions like diabetes, obesity, and poor diet may have an elevated cancer risk.

This discovery also offers new insights into how cancer can develop even without the complete inactivation of both BRCA2 gene copies, traditionally thought necessary according to Knudson's “two-hit” hypothesis, which states that for a tumour suppressor gene like BRCA2 to lose its cancer-preventing ability, both copies of the gene must be inactivated. However, their latest research indicates that MGO can temporarily bypass this requirement by causing BRCA2 protein degradation, leading to cancer-associated mutations even when only one copy of the BRCA2 gene is affected. The team also found that MGO can temporarily inactivate such cancer-preventing genes, suggesting that repeated episodes of poor diet or uncontrolled diabetes can 'add up' over time to increase cancer risk. This new knowledge is likely to be influential in changing the direction of future research in the area of lifestyle habits and cancer.

Deciphering the Regulatory Landscape of Murine Splenic Response to Anemic Stress at Single-cell Resolution (Apr 2024, Blood Advances)



Prof. Toshio Suda, Senior Principal Investigator at CSI Singapore, and his team have uncovered new molecular mechanisms behind stress erythropoiesis—the process by which stressors, such as hemolysis and bleeding, may cause disruption of erythrocytes production. By studying spleen tissue from mice subjected to different types of anemic stress, they discovered key phases in the development of early red blood cells and identified a novel marker, CD81, crucial for the function of central macrophages in erythroblastic islands (EBIs).

These macrophages help support red blood cell production during stress. This research reveals how early erythroid cells respond to stress, highlighting potential targets for new treatments to improve red blood cell production in anemia and related conditions.

A PRMT5-ZNF326 axis mediates innate immune activation upon replication stress (June 2024, Science Advances)

Asst. Prof. Anand Jeyasekharan, Principal Investigator and Facility Head of Microscopy and Multiplex Assay Core at CSI Singapore has led a team, together with co-author Asst. Prof. Dennis Kappei unveiling critical findings on the role of protein arginine methyltransferase 5 (PRMT5) in mediating DNA replication stress (RS) and its implications for cancer treatment. RS, a common phenomenon in cancer development, disrupts DNA replication, causing damage and genomic instability.

The research identified PRMT5 as a crucial player in activating interferon-stimulated genes (ISGs) during RS. PRMT5 also targets the zinc finger protein ZNF326, which is essential for the ISG response. This interaction involves a specific modification called symmetric dimethylarginine (SDMA), which PRMT5 applies to ZNF326 during RS. Upon RS induction, PRMT5 relocates from the cytoplasm to the nucleus, increasing SDMA levels and enhancing ISG expression. This study highlights PRMT5 as a significant regulator of immune signalling in response to DNA replication stress, opening up new avenues for cancer treatment strategies. By understanding and manipulating PRMT5 activity, there is potential to enhance the efficacy of existing therapies and develop novel approaches to combat cancer more effectively.

Hepatocyte-macrophage Crosstalk Via the PGRN-EGFR Axis Modulates ADAR1-mediated Immunity In the Liver (Jun 2024, Cell Reports)

Assoc. Prof. Polly Chen, Principal Investigator at CSI Singapore, and her team have uncovered the intricate mechanisms our bodies use to differentiate between harmful and benign genetic material. This study focused on a critical enzyme called ADAR1, which plays a vital role in maintaining immune balance by editing double-stranded RNA (dsRNA). Normally, this process helps prevent the immune system from mistakenly attacking the body's own cells. When ADAR1 is missing, unnecessary immune attacks occur.

In the liver, this can cause severe inflammation and damage. The research showed that while blocking one immune sensor (MDA5) can save mice from early death, it does not prevent liver disease. This is because another molecule, progranulin (PGRN), drives inflammation by attracting immune cells to the liver. In cancers, high ADAR1 levels, together with its various downstream partners, help tumours hide from the immune system, suggesting these players as potential therapeutic targets to fight cancer more effectively.

PARP4 Interacts with HnRNPM to Regulate Splicing During Lung Cancer Progression (Jul 2024, Genome Medicine)

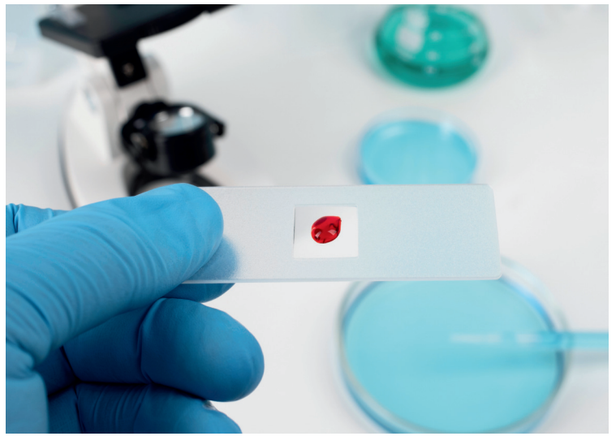
Lung cancer is among the most frequently occurring cancers and a leading cause of cancer mortality worldwide. **Assoc. Prof. Wai Leong Tam** together with **Assoc. Prof. Yvonne Tay** as one of the co-authors, Principal Investigators at CSI Singapore, have identified a novel cancer driver gene, PARP4, that plays a crucial role in lung adenocarcinoma (LUAD). Among lung cancer cases, LUAD presents as the most prevalent subtype. Using whole-exome sequencing of the largest Asian LUAD cohort to date, the study revealed that PARP4 acts as a tumour suppressor.

When PARP4 is depleted or mutated, it increases the tumorigenicity of lung cancer cells driven by KRAS or EGFR mutations. Unlike previously thought, this tumour-suppressive activity by PARP4 is independent of the vault complex (a massive ribonucleoprotein complex), with which PARP4 is often associated with. Instead, it was established that hnRNPM is a novel PARP4 interaction partner that is also key to regulating LUAD tumorigenicity. Loss of hnRNPM, like loss of PARP4, leads to increased tumour formation and splicing disruptions. This study highlights the importance of splicing regulation in cancer development and provide greater insights into precision medicine development. Understanding PARP4's novel mechanisms in LUAD offers promising potential for developing new treatments for LUAD, broadening the repertoire of therapeutic targets and biomarkers in lung adenocarcinoma.

Oncogenic Dependency on SWI/SNF Chromatin Remodeling Factors in T-cell Acute Lymphoblastic Leukemia (Jul 2024, Leukemia)

Assoc. Prof. Takaomi Sanda together with **Dr. Shi Hao Tan**, Senior Research Scientist, have discovered a crucial role for the SWI/SNF chromatin remodelling complex in T-cell acute lymphoblastic leukemia (T-ALL), a type of cancer originating from immature T-cells, affecting both children and adults. Despite advancements in treatment, some patients fail to respond or relapse, facing a survival rate of less than 25%, thus this research becomes crucial for possible new treatments. While the role of certain oncogenes like NOTCH1 and MYC in T-ALL is well-known, the involvement of chromatin remodelling factors has remained elusive—until now. High expression of SMARCA4, a subunit of the SWI/SNF complex, was observed in T-ALL cells, and its inhibition led to increased cell death and growth suppression. This study reveals that SWI/SNF interacts with the transcription factor RUNX1 to maintain open chromatin regions essential for the NOTCH1-MYC pathway, underscoring SWI/SNF as a potential therapeutic target. This research offers new insights into T-ALL mechanisms and highlights the potential of PROTAC drugs to target the chromatin remodelling process, paving the way for novel therapeutic treatments and improved patient outcomes.

Super Enhancer Acquisition Drives Expression of Oncogenic PPP1R15B that Regulates Protein Homeostasis in Multiple Myeloma (Aug 2024, Nature Communications)



Multiple myeloma (MM), a common blood cancer, begins in antibody-secreting plasma cells. Through comprehensive transcriptomic and phenomic analyses, **Prof. Wee Joo Chng**, Senior Principal Investigator at CSI Singapore, and his team compiled a list of candidate genes driven by Super Enhancers (SE) which have key implications in MM. SE are a dense cluster of mediator and transcription regulating proteins, which induces the target gene to be expressed at a substantially higher level than a single enhancer.

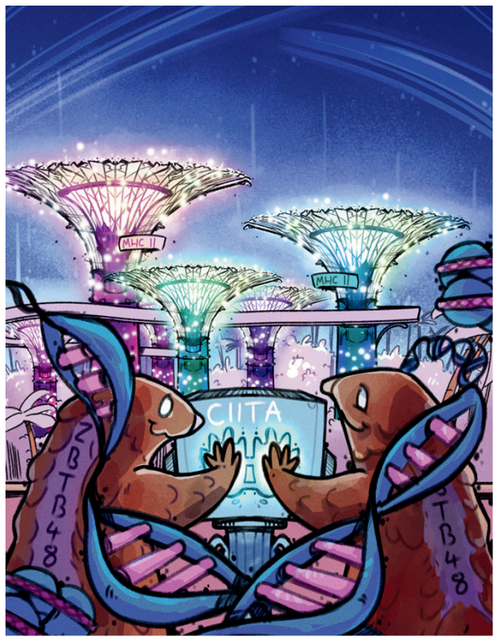
They discovered that myeloma cells often acquire SE which transcriptionally activates an oncogene, PPP1R15B which regulates translation initiation factor eIF2α. Their research shows that inhibition of PPP1R15B has potential anti-myeloma effects as myeloma cells are vulnerable to disruption of PPP1R15B-dependent protein homeostasis. This suggests that PPP1R15B and/or eIF2α can be promising new therapeutic targets in the treatment of MM.

Fratricide-resistant CD7-CAR T Cells in T-ALL (Sep 2024, Nature Medicine)

Researchers at the National University of Singapore, led by **Prof. Dario Campana**, a Senior Principal Investigator from the Cancer Science Institute of Singapore, have made significant advancements in treating T cell acute lymphoblastic leukaemia (T-ALL). This disease is notoriously difficult to treat, with poor outcomes, particularly when it relapses or resists standard chemotherapy The team focused on improving chimeric antigen receptor (CAR) T cell therapy by targeting CD7, a protein present on T-ALL cells and normal T cells. The researchers developed an anti-CD7 protein expression blocker (PEBL) that retains CD7 within the cell, preventing CAR T cells from attacking each other. In this case series, 16 of 17 patients treated with this modified CAR T cell therapy experienced significant reduction in disease burden within a month and experience minimal side effects. Over 60% of patients remained relapse-free after 15 months, and one patient has been in remission for nearly six years. This novel approach shows strong potential as an effective treatment for T-ALL.

ZBTB48 is a Priming Factor Regulating B-Cell-Specific CIITA Expression (Dec 2024, The EMBO Journal, Cover story)

Led by Principal Investigator, **Asst. Prof. Dennis Kappei**, the study identifies how ZBTB48, represented as pangolins, binds to two distinct binding sites at the B-cell-specific promoter of CIITA, the master regulator of the MHC-II immune gene expression program, to activate the CIITA “switchboard” and initiate CIITA expression. This in turn causes expression of MHC-II molecules, antigen presenting complexes at the cell surface, here represented by illumination of the iconic supertrees found in Singapore’s Gardens by the Bay.



B. NUS Scientists Uncover a Missing Link Between Poor Diet and Higher Cancer Risk

A research team from the National University of Singapore (NUS) has uncovered new insights that could help explain the link between cancer risk, poor diet, and common diet-related diseases like diabetes. These findings have the potential to enhance cancer prevention strategies, particularly those aimed at promoting healthy aging.

Led by **Prof. Ashok Venkitaraman**, Director of CSI Singapore and the NUS Centre for Cancer Research (N2CR), this ground-breaking study was conducted by scientists from CSI Singapore at NUS and N2CR under the Yong Loo Lin School of Medicine, with colleagues from the Agency for Science, Technology and Research (A*STAR).

The research began with an investigation into patients who are at high risk for breast or ovarian cancer due to an inherited mutation in the BRCA2 gene. The team found that cells from these patients were especially vulnerable to the effects of methylglyoxal, a chemical byproduct produced when our cells break down glucose for energy. This chemical was shown to cause DNA damage, which can serve as an early indicator of cancer development Moreover, the study suggests that individuals who do not inherit a faulty BRCA2 gene but who experience elevated levels of methylglyoxal—such as those with diabetes or pre-diabetes, often related to poor diet or obesity—may also accumulate similar DNA damage, putting them at increased risk of cancer.

The team’s findings also challenge a longstanding theory about cancer-preventing genes, known as Knudson’s "two-hit" paradigm, proposed in 1971. This theory suggested that such genes must be permanently inactivated in cells for cancer to develop. However, the NUS team discovered that methylglyoxal can temporarily inactivate these protective genes, indicating that repeated poor dietary habits or uncontrolled diabetes may gradually increase cancer risk over time. This new perspective is expected to shape future research in the field.

Building on their groundbreaking discoveries, the researchers plan to conduct further studies to explore how metabolic disorders like diabetes and poor diets might influence cancer risk in Singapore and other Asian countries. Their goal is to uncover additional mechanisms linking metabolism, diet, and cancer, ultimately leading to more effective strategies for cancer prevention and delayed onset.

The team’s significant findings were published in Cell (11 April 2024): https://doi.org/10.1016/j.cell.2024.03.006, highlighted in NUS News : https://news.nus.edu.sg/poor-diet-and-higher-cancer-risk/ and featured in Lianhe Zaobao: https://www.zaobao.com.sg/news/singapore/story20240412-3392713

C. Advanced Technology to Study Macrophage in Lymphoma: A Step towards Personalized Therapy

Researchers at the Cancer Science Institute of Singapore (CSI), National University of Singapore (NUS), led by **Asst. Prof. Anand Jeyasekharan**, have made significant strides in understanding a type of cancer known as diffuse large B-cell lymphoma (DLBCL). They focused on a specific type of immune cells called "macrophages" found in the cancer's environment and discovered that variations in these cells are linked to how well patients might recover and survive.

Previously, conducting “bulk” studies on immune cells in cancer provided only a broad overview. However, with the advanced technology from Nanostring Technologies Inc., GeoMx Digital Spatial Profiling (DSP) available at CSI’s Microscope and Multiplex Assay (MMA) core facility, the team can now examine the molecular features of macrophages with single-cell resolution while preserving their spatial context. This breakthrough allows them to identify distinct macrophage profiles, which can predict disease progression more accurately. It also opens new avenues for personalized treatment strategies for DLBCL, potentially improving patient outcomes.

The core of the research lies in exploring the diversity of macrophages within the DLBCL tumor microenvironment. This not only helps predict the disease's progression more precisely but also uncovers potential new therapeutic targets. By leveraging NanoString's cutting-edge technology, the study provides a fresh view of the tumor microenvironment, underscoring the critical role of macrophage diversity in understanding and treating DLBCL.

The findings hold major implications, offering a pathway toward more tailored and effective treatments. By pinpointing specific macrophage patterns linked to patient outcomes, the research sets the stage for developing personalized therapies. Additionally, the insights into macrophage diversity could lead to the discovery of new drugs and treatment strategies aimed at altering the tumor microenvironment to better combat DLBCL.

Looking ahead, Dr. Jeyasekharan's team plans to further investigate the biological and clinical significance of the macrophage profiles they have identified. They aim to understand how these profiles influence disease progression and patient survival, potentially leading to the development of new diagnostic tools and treatment options customized to each patient's unique condition. These advancements could not only revolutionize the treatment of DLBCL but also contribute to the fight against other forms of cancer.

This paper was published in Nature Communications (8 March 2024) Spatially-resolved transcriptomics reveal macrophage heterogeneity and prognostic significance in diffuse large B-cell lymphoma | Nature Communications and highlighted in NUS News : Variations in “ancient” immune cells linked to patients’ survival in cancer

D. New Treatment Offers Hope for T-cell Leukaemia That Does Not Respond to Conventional Therapies

Researchers at the National University of Singapore (NUS), under the guidance of **Prof. Dario Campana**, a Senior Principal Investigator from CSI Singapore, have developed a novel improvement to a previously challenging treatment for T cell acute lymphoblastic leukaemia (T-ALL). T-ALL which originates from early T cell precursors, is a subtype of acute lymphoblastic leukaemia (ALL) and is one of the most common cancers in children and young people. While intensive and prolonged chemotherapy can cure most paediatric patients, adult patients often do not fare as well.

This disease is notoriously difficult to treat, with poor patient outcomes, particularly when it relapses or resists standard chemotherapy. One treatment option for such patients is chimeric antigen receptor (CAR) T cell therapy. The NUS/CSI study team focused on a specific immune cell type, T lymphocytes (T cells), and targeted CD7, a transmembrane glycoprotein present on nearly all T-ALL cells. However, CD7 is also found on normal T cells, including CAR T cells, which can lead to CAR T cells attacking and destroying each other.

To address this issue, the team developed an anti-CD7 protein expression blocker (PEBL) that prevents CD7 from being expressed on the cell surface while retaining it inside the cell without affecting T cell function. In their study, 16 out of 17 patients treated with modified CAR T cells (which included the anti-CD7 PEBL) experienced significantly reduced disease burden within one month, with minimal side effects. With a median follow-up period of 15 months, over 60% of the patients remained relapse-free, and one patient has been in remission for nearly six years with no further intervention. The modified CAR T cells were detectable in the patients' bloodstream for up to two years, and the newly generated T cells lacked CD7 expression, were polyclonal, and responded well to vaccinations. This approach shows great promise as an effective treatment option for T-ALL.

The team’s significant findings were published in Cell (11 April 2024): https://doi.org/10.1038/s41591-024-03228-8 and highlighted in The Straits Times : https://www.straitstimes.com/singapore/health/new-treatment-offers-hope-for-t-cell-leukaemia-that-does-not-respond-to-conventional-therapies

Media Features

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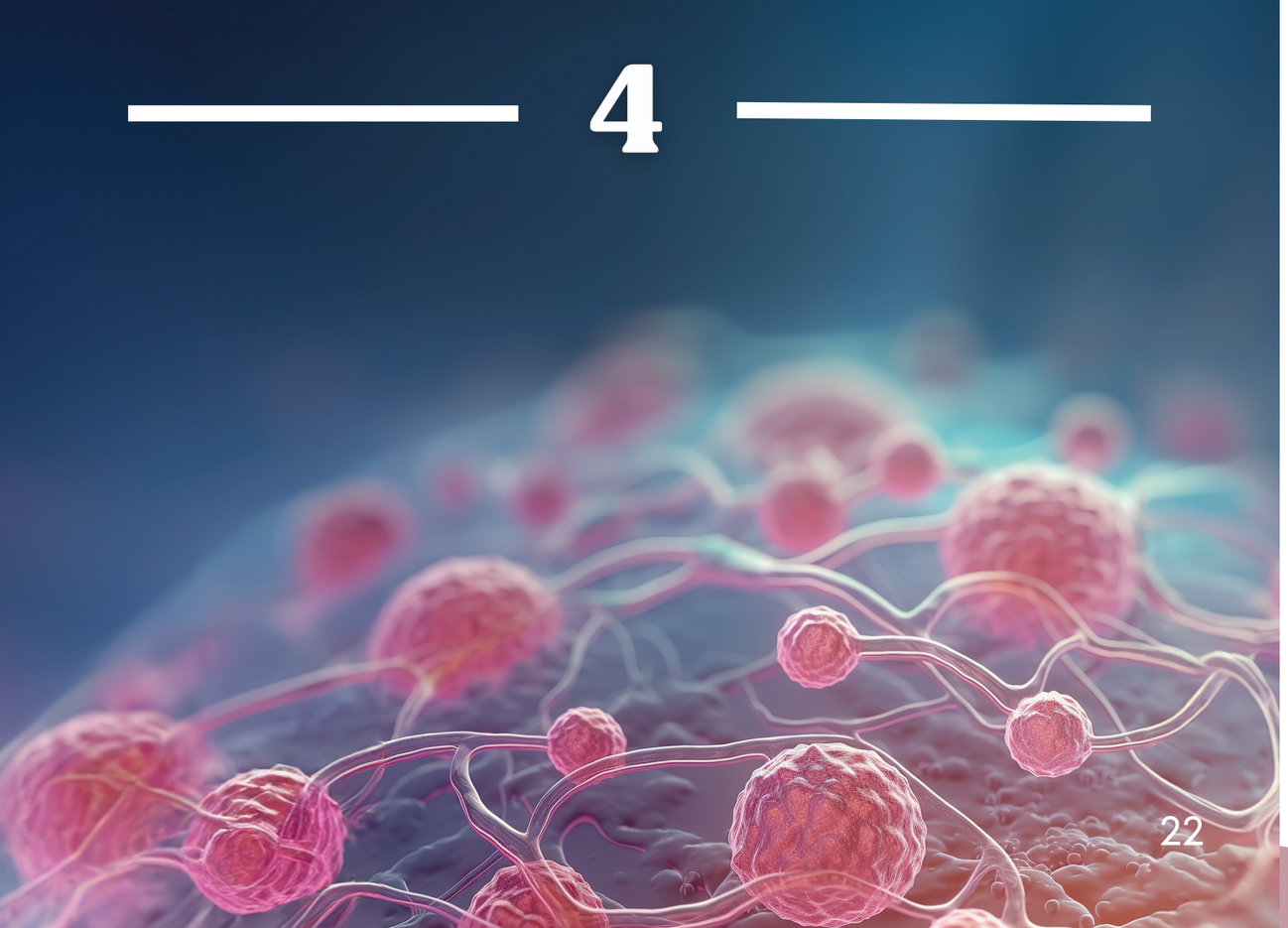


A. Diana Koh Learning Series

This year, CSI Singapore held the inaugural “Diana Koh Breakthroughs in Cancer Learning Series,” featuring renowned speakers Prof. Ashok Venkitaraman and Asst. Prof. Anand Jeyasekharan and it was an inspiring one. Prof. Ashok held an insightful talk on “Cancer: What’s in our genes, and what isn’t” while Asst. Prof. Anand Jeyasekharan hit close to home with his talk “What are we doing in Singapore to improve outcomes for sarcoma patients?”

This event aimed to educate the general public on cancer and the latest advancements in cancer research, fostering a culture of learning and collaboration within the community.

The event also celebrated the achievements of our young researchers through the presentation of the ‘Diana Koh Young Innovator Prize’ and the ‘Diana Koh Young Innovator Grant.’ These awards, supported by CSI Singapore, NUS Medicine, and the NUS Centre for Cancer Research (N2CR), recognize and encourage innovative cancer research among junior researchers and graduate students.

The Diana Koh Foundation, established in memory of the late Ms. Diana Koh, has generously contributed S$500,000 towards cancer research. This gift empowers young researchers by providing them with the resources needed to pursue independent projects and explore their research interests, offering them greater control over their learning and the means to bring their ideas to fruition.

We are pleased to announce the awardees of the **Diana Koh Young Innovator Grant 2024**:

- Dr. Elayanambi Sundaramoorthy and Dr. Li Ren Kong (CSI Singapore / NUSMed) for their project "Understanding the Mechanistic Basis for PARPi Sensitivity in Ewing’s Sarcoma."
- Dr. Haoqing Shen (CSI Singapore) for his project "Potentialize Mitochondrial dsRNA–Induced Innate Immunity for Cancer Treatment."

The **Diana Koh Young Innovator Prize 2024** was awarded to:

- PhD student You Heng Chuah (NUSMed) for his research on Glioblastoma (GBM), the deadliest brain tumor with limited treatment options.
- Li Ren Kong (NUSMed) for his research on the impact of cellular metabolism on cancer susceptibility and progression.

We congratulate all the awardees and thank the Diana Koh Foundation for their invaluable support in advancing cancer research.

B. Professor Yoshiaki Ito's Farewell

The Cancer Science Institute of Singapore (CSI Singapore) had the honour of hosting "Professor Yoshiaki Ito: A Lifetime of Scientific Investigation" seminar, in recognition of Prof. Ito's lifetime achievements in his scientific discoveries. This seminar celebrated Prof. Ito's illustrious career, with a series of lectures from Prof. Ito himself, as well as from his close collaborators and mentees. It was a heartfelt event, filled with admiration and respect, as colleagues gathered to honour a man whose contributions have significantly shaped cancer research and mentorship. We would like to extend our gratitude to Dr. Paul Liu, Dr. Ichiro Taniuchi, Prof. Motomi Osato, and Prof. Suk-Chul Bae for joining us on this special occasion.

Throughout his tenure at the CSI Singapore, Prof. Ito has been a beacon of innovation and dedication. His relentless pursuit of knowledge and groundbreaking research have set new benchmarks in the field of RUNX3 in oncology. Prof. Ito's work has advanced our understanding of cancer biology and paved the way for novel therapeutic strategies, improving the lives of countless patients.

Our esteemed lineup of professors and researchers took the stage to share their fond memories and express their gratitude. Each speaker highlighted different facets of Prof. Ito's remarkable career.

Prof. Ito's role as a mentor was profoundly emphasized. Many speakers recounted their personal journeys under his guidance, noting his unwavering support and insightful advice. He was celebrated for nurturing young scientists, fostering a culture of curiosity, and instilling a passion for discovery.

The seminar also showcased Prof. Ito's extraordinary contributions to cancer research. Colleagues reflected on his pioneering studies, which have been pivotal in advancing our understanding of cancer mechanisms and treatment. His meticulous approach to scientific investigation and his ability to translate complex research into clinical applications were lauded as inspirational.

Beyond his professional achievements, Prof. Ito was remembered as a cherished friend and colleague. Anecdotes about his kindness, and collaborative spirit painted a picture of a man who excelled in his field and enriched the lives of those around him.

The event was inspiring as our lineup of esteemed speakers encouraged the next generation of researchers to continue pushing the boundaries of knowledge, emphasizing the importance of perseverance and passion in the pursuit of scientific excellence. As Prof. Ito embarks on his well-deserved retirement, his contributions to the CSI Singapore and the broader scientific community, both locally as well as globally, will be remembered and celebrated for years to come.

EDUCATION

5

A. CSI Graduate Program

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 in 2010, 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.

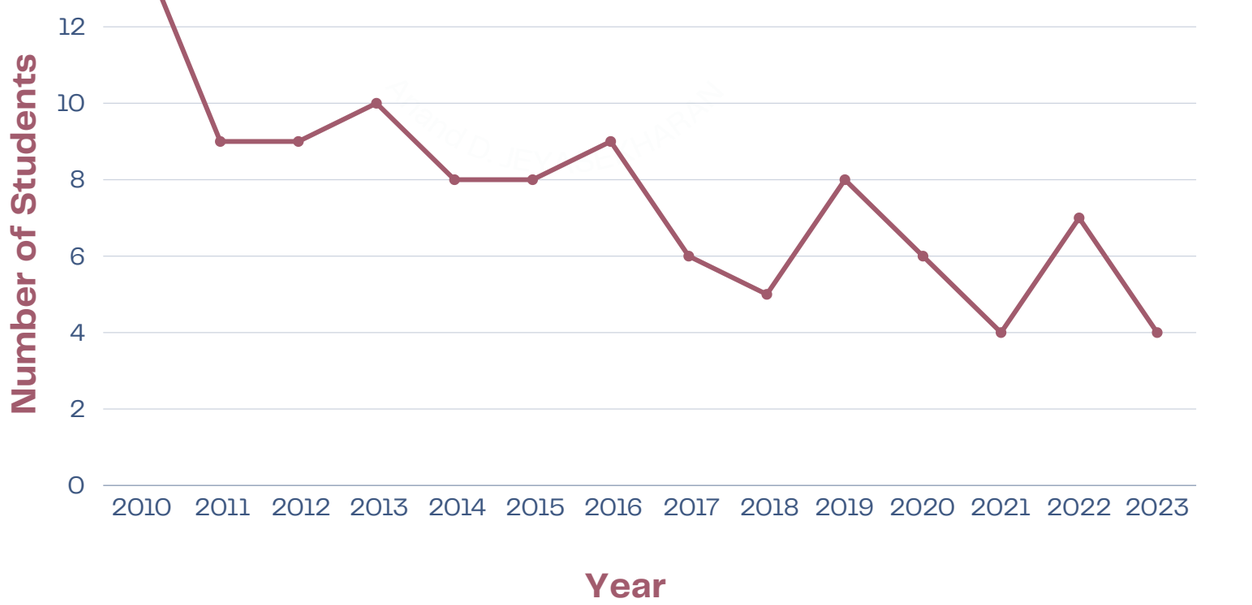
Our graduates have moved on to a variety of opportunities after their PhD studies. Many have taken up academic positions at various world-renowned institutions.

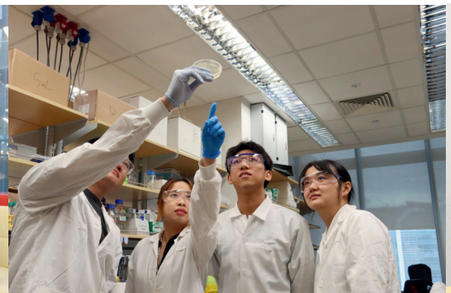
A. CSI Graduate Program

4
Students Admitted

55
Students Applied

49
Existing Students





B. 2024 Graduates

On 12 July 2024, the Cancer Science Institute of Singapore (CSI Singapore) proudly hosted its annual PhD Graduation Party, a heartfelt celebration held at CSI Singapore. This intimate event brought together our graduates, their thesis advisors and their peers, commemorating the significant milestone of completing their doctoral studies.

Prof. Chng Wee Joo's Lab

From left to right – Dr. Xiong Sinan, Dr. Koh Mun Yee, Prof. Chng Wee Joo and Dr. Lim Sze Lynn, Julia

Dr. Xiong Sinan

Were there any moments when you felt particularly discouraged, and how did you push through those times?

At the start of one of my first experiments, we had a lot of genes that we wanted to screen for therapeutic potentials. However at that point of time, majority of the identified genes did not appear promising, and I had a challenging time finding therapeutically-interesting genes for my PhD project. Thankfully after screening through more than 50 genes, I finally found some potential targets, which was encouraging.

What skills or insights have you gained that you think will be most valuable in your future career?

One of the most valuable skills for my future career is the ability to troubleshoot. Often, when working with patients' limited and precious clinical samples, we must test them under various conditions to obtain the best results from minimal material. This requires extensive troubleshooting to optimize conditions for further experiments, and this skill is also applicable to other future projects.

Dr. Lim Sze Lynn, Julia

If you could go back in time and give yourself one piece of advice at the start of your PhD, what would it be?

The advice I would give myself is don't be afraid of uncertainties.

What is your favourite memory from your PhD studies at CSI Singapore, under Prof. Chng Wee Joo?

My favourite memory of my PhD journey in the lab was during the Covid pandemic, during our AM/PM shifts, having to plan my experiments whilst juggling the AM/PM shifts.

Dr. Koh Mun Yee

What skills or insights have you gained that you think will be most valuable in your future career?

Besides the technical skills, I believe these two key skills that I gained in my PhD journey are certainly the most valuable—Time management and analytical thinking skills. 4 years of PhD journey may seem like an ocean of time, but in the face of coursework, interesting seminars and workshops as well as your own research, balancing a packed schedule can be challenging sometimes. Furthermore, before delving into a research project, we are often required to analyse the problem and understand the unmet needs. Carefully examining the relevant literature, performing experiments, analysing data and writing to communicate our findings are key to solving our research question.

If you could go back and give yourself one piece of advice at the start of your PhD, what would it be?

One advice I would give myself is to be clear with your purpose of pursuing a PhD and seize every opportunity to learn. These 4 years of PhD can be filled with many uncertainties and at times you may feel stuck or that you are moving backwards in your research, however, if you can push through it, it will be a very rewarding and memorable experience. "Climb, not so the world can see you, but so you can see the world!"

A/Prof. Edward Chow's Lab

From left to right – Dr. Dexter Thng Kai Hao, A/Prof. Edward Chow and Dr. Noor Rashida Binte Meera

Dr. Noor Rashidha Binte Meera

What do you consider to be the most important qualities of a successful PhD student?

I believe that all PhD students should be hardworking. Despite multiple failures, which are inevitable, you need to be resilient, keep pushing forward, and trust that you'll eventually obtain the desired results. When you finally achieve this, the sense of happiness and pride from making something work will overshadow all your struggles. Therefore, being hardworking and continuously learning from your mistakes are essential qualities for a PhD student.

Dr. Dexter Thng Kai Hao

If you could go back in time and give yourself one piece of advice at the start of your PhD, what would it be?

One piece of advice I would give to myself at the start of my PhD is to be less harsh and more lenient on myself. I feel that over the 4 years, there were many times when I put too much pressure on myself, and it was quite tough mentally as well as very draining. At the same time, after speaking to other graduates, colleagues and students, I realised that this pressure was something that was normal for PhD students to feel. When things get tough and things do not go your way, it is very normal to feel like this. Hence, I should not beat myself up. I should be more lenient/self-critical and give myself the benefit of the doubt. By doing this, my next 4 years would be more enjoyable and memorable. This would overall make the PhD process so much more meaningful and will also allow the student to have better mental health.

A/Prof. Polly Chen's Lab

A/Prof. Polly Chen (Thesis Advisor to Gan Wei Liang & Larry Ng Tze Hiang)

What is your most cherished memory from mentoring this batch of PhD graduates?

For me, the most special moment during these four years of supervision is when I finally see my students start to feel proud of themselves.

Dr. Gan Wei Liang

What is your favourite memory from your PhD studies at CSI Singapore, under A/Prof. Polly Chen?

For me, it was very early on during rotations. It was at night and both Larry and I chose to be in Polly's lab, but she could only take 1 student, so I was very scared I would not get in. However, Polly managed to work out her lab arrangement such that we can both be supervised by her. That moment was very special to me because it marked a significant change in my life.

Dr. Larry Ng Tze Hiang

What is your favourite memory from your PhD studies at CSI Singapore, under A/Prof. Polly Chen?

For me, it was when I messed up my last Thesis Advisory Committee (TAC) review, and Polly was there the entire time to encourage me. She offered many kind words and motivated me to do better.

From left to right – Dr. Gan Wei Liang, A/Prof. Polly Chen and Dr. Larry Ng Tze Hiang

Congratulations to all the PhD graduates! Your dedication, hard work, and perseverance have culminated in this remarkable achievement. The road to a PhD is long and challenging, but your commitment to advancing our understanding of cancer is truly inspiring. As you step into this next chapter of your careers, know that your contributions are invaluable and have the potential to make a profound impact on the future of cancer treatment and research. Well done, and best wishes for continued success in your important work!

Awards & Honours

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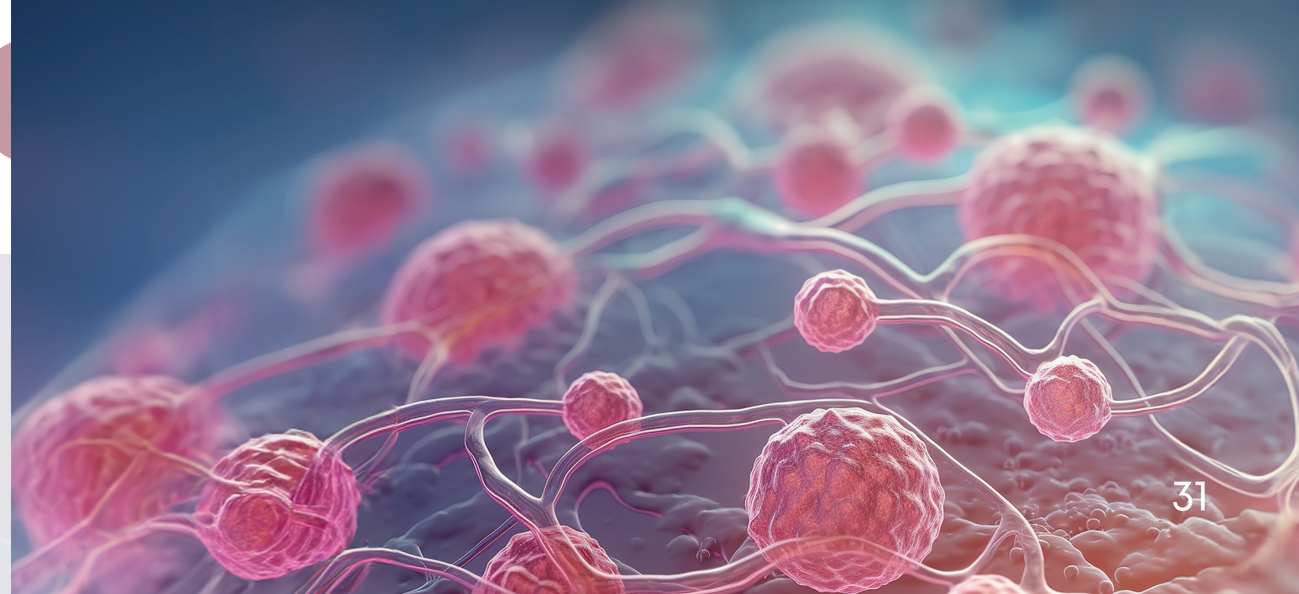

Staff Awards

Nurkaiyisah Zaal Anuar
Senior Lab Executive
FCS 2023 Poster Presentation: 1st Place
Frontiers in Cancer Science 2023

Dr. Alexia Hillairet
Research Fellow
FCS 2023 Poster Presentation: 4th Place
Frontiers in Cancer Science 2023

Dr. Bibek Dutta
Research Fellow
Early Career Research Travel Grant Award
Molecular Biology Society of Japan

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

Dennis Kappei
Assistant Professor
EMBO Global Investigator Network
EMBO

Dr. Elayanambi Sundaramoorthy
Senior Research Scientist
Young Innovator Grant
(Co-PI: Dr. Li Ren Kong, NUSMed)

Staff Awards

Chng Wee Joo
Professor
Singapore Translational Research Investigator Award,
National Medical Research Council (NMRC)
Distinguished Senior Clinician Award (DSCA) 2024
Ministry of Health

Ashok Venkitaraman
Professor
Top 2% Most-cited Scientists in the World for 2024
(Single-recent-year impact)
top 2% Most-cited Scientists in the World for 2024
(Career-long impact)
Elsevier

Dr. Tony Tan Tuan Zea
Top 2% Most-cited Scientists in the World for
2024 (Single-recent-year impact)
Elsevier

Lee Soo Chin
Professor
Distinguished Senior Clinician Award (DSCA) 2024
Ministry of Health

Scientific Events

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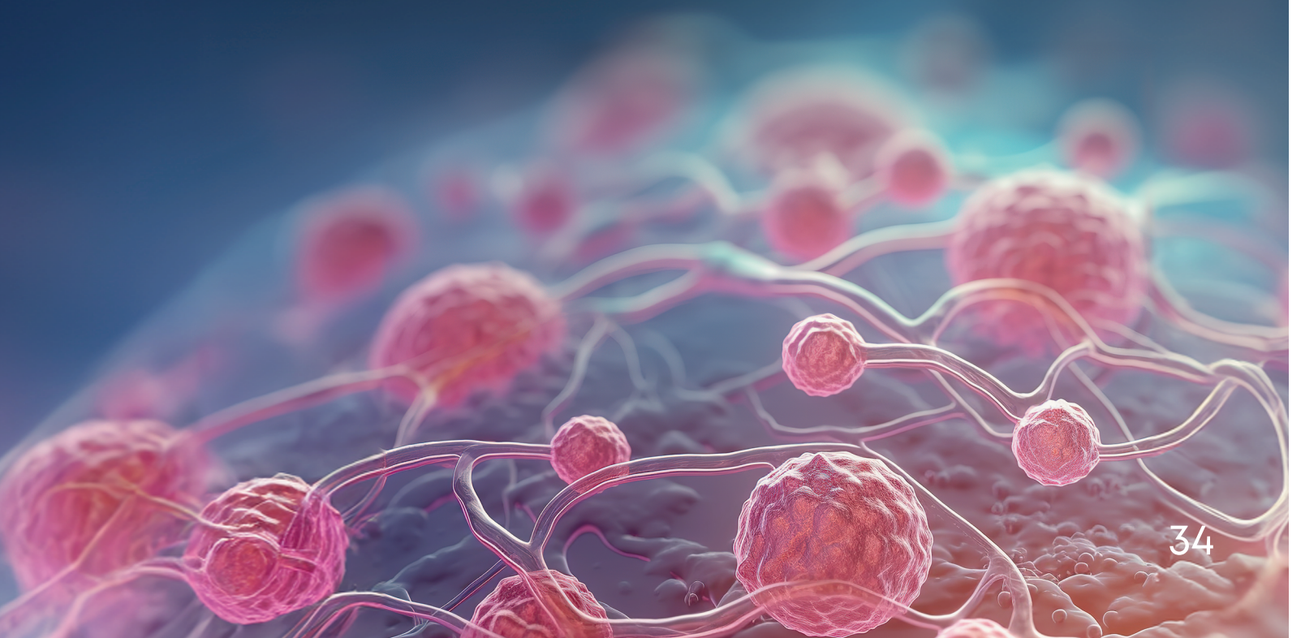


A. Research Meetings

Date	Speakers	Title
5 January 2024	The Phyu (PhD student/ Research Assistant)	Exploring Epstein Barr Virus (EBV) Involvement in Extranodal NK/T-Cell Lymphoma (ENKTL) Pathogenesis
	Dr. Woo Jun Yung, Research Fellow	Reprogrammed mesenchymal stem cells for targeted delivery of chemoimmunotherapeutics in gastric cancer
19 January 2024	Kong Li Ren (Lee Kuan Yew Fellow)	Glycolysis Disables BRCA2 Tumour Suppression Eliciting Cancer-related Mutational Signatures
	Muhammad Bakhait Bin Rahmat (Research Scientist)	The Role of IQGAP3 in Wnt Signalling
2 February 2024	Jayshree Hirpara (Research Associate)	Tumor-derived Extracellular Vesicles Mediate Metabolic Programming of Tumor Microenvironment via Solute Transporter
	Charlie Marvalim (PhD Student)	PROTAC A1874: A Potential Targeted Therapy for Breast Cancer
16 February 2024	Felix Blanc (PhD Student)	Genomic Instability in Endometrial Cancer, Friend or Foe?
	Teresa Ho (Research Fellow)	Dynamic Interactions between Premalignant Clones Promote Malignant Progression in the Colon

A. Research Meetings

Date	Speakers	Title
22 March 2024	Norbert Tay (PhD Student)	Characterizing the Tumour Immune Microenvironment of ARID1A-deficient Gastric Cancer
	Sanjay De Mel (PhD Student)	Single Cell Multi-Omic Profiling of Multiple Myeloma with t(4;14) to Identify Tumor Microenvironmental Determinants of Clinical Outcomes
5 April 2024	Aprathi Mysuru Prabhakara (Research Associate)	Investigating the Role of ARID1A in DNA Replication Fork Stabilization
	Sharon Chan Pei Yi (PhD Student)	Combinatorial Functionomics Identifies HDAC6-dependent Molecular Vulnerability of Radioresistant Head and Neck Cancer
10 May 2024	Zachary Gates (Senior Scientist)	Synthetic Libraries and 'Affinity Selection – Mass Spectrometry' for Peptide Ligand Discovery
	Chew Ern Sen (PhD Student)	Surfaceome Profiling for the Identification of Novel Immunotherapeutic Targets in Natural Killer/T cell Lymphoma (NKTL)
24 May 2024	Han Jian (Research Scientist)	Characterization of a Novel Repressor of Cellular dsRNA Formation and Innate Immune Activation
	Regina Tong (Research Assistant)	Vascular Endothelial Growth Factor – A Player in the Tumor Microenvironment of Nasopharyngeal Carcinoma

A. Research Meetings

Date	Speakers	Title
21 June 2024	Junlong Song (Visiting Fellow)	Tumor Spatial Transcriptomics Reveal Potential Mechanisms of Intrinsic Resistance to HER2 Directed Therapy
	Wu Zhengwei (Research Fellow)	IMPRINTS-CETSA Reveals Regulators of JQ1 Resistance in Acute Myeloid Lymphoma
19 July 2024	Charmaine Ong (PhD Student)	Pre-Clinical Evaluation of MACIR as a Novel Therapeutic Target in Diffuse Large B Cell Lymphoma
	Xiong Sinan (Research Fellow)	Super-enhancer-driven PPP1R15B as an Oncogenic and Potential Therapeutic Target in Multiple Myeloma
2 August 2024	Nurkaiyisah Zaal Anuar (Senior Laboratory Executive)	The TARZN Complex Binds to de novo Enhancer Mutations and Promotes Oncogenic Expression in T-ALL
	Cinnie Soekojo (PhD Student)	Coordinated Changes in the Tumor Microenvironment (TME) are Associated with Increased Risk of Therapeutic Failure in Newly Diagnosed Diffuse Large B-Cell Lymphoma (DLBCL)
16 August 2024	Yeo Shih Chia (Research Scientist)	The Role of circFLT3 in Regulating Cell Growth and Differentiation in Acute Myeloid Leukemia
	Andy Wu (PhD Student)	Leveraging AI for the Conditional Generation of Mutational Profiles in Cancer

A. Research Meetings

Date	Speakers	Title
20 September 2024	Madan Mohan Udaya Kumar (PhD Student)	Quantitative R-loop Profiling Reveals RNA Polymerase III Target Genes as Major Sites of R-loop Formation
	Tang Sze Jing (Senior Research Scientist)	Regulatory Role of ADAR2 in dsRNA mediated Immunity
4 October 2024	Faith Cheong Jiunn Fung (PhD Student)	Investigating the Role of 3'UTR Splicing in Colon Cancer
	Yeo Hui Qing (PhD Student)	Functional Consequences of Structural Variants Arising from Extracellular Domain Mutations in Epidermal Growth Factor Receptor
18 October 2024	Yang Li (Research Scientist)	TCR Virtual Screening and Design for Novel Antigenic Peptides with Language Models
	Phyllis Chong (Senior Research Fellow	MAF-Driven Metabolic Reprogramming Mediates H3K27 Hyperacetylation to Regulate t(14;16)-Specific Superenhancer Genes

B. Distinguished Speakers' Series

Prof. Hideyuki Saya
Cancer Centre at Fujita Health University, Japan (Hybrid Seminar)
15 Feb 2024
Development of New Strategies for Treatment-resistant Cancer Cells and Fibrosis

Dr. Bernd Pulverer
EMBO Reports, EMBO Press, Germany
22 Apr 2024
Transparent Publishing: How Best to Share Reproducible High-quality Data

Prof. Tasuku Honjo
Kyoto University, Japan
24 May 2024
Story of PD-1: A Thirty Year Journey from Discovery

Prof. Hiroyuki Mano
National Cancer Center Research Institute, Japan
31 May 2024
National Platform of Cancer Genomic Medicine in Japan

Prof. Joseph J Y Sung
Lee Kong Chian School of Medicine, Nanyang Technological University, Singapore
8 Oct 2024
Gut Microbiome and Response to Immunotherapy in CRC

C. Seminars

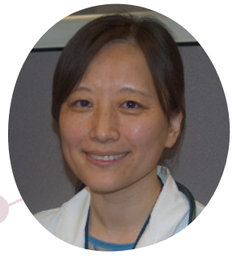
Dr. Gerry Crossan
University of Cambridge, UK
18 Jan 2024
Where does the damage come from? Physiological sources of DNA damage in development and cancer

Dr. Sizun Jiang
Harvard Medical School, USA
13 Feb 2024
Spatial-omics in Host- Disease Interactions

Dr. Yilong Zhou
Max Planck Institute of Immunobiology and Epigenetics, Germany
18 Apr 2024
Noncanonical DHX9 stress granule protects daughter cells from RNA damage

Prof. Ping-Chih Ho
Ludwig Institute for Cancer Research at University of Lausanne, Switzerland
2 May 2024
Metabolic Communication and Targeting in the Tumor Microenvironment

Dr. Corina E. Antal
UC San Diego Moores Cancer Center, USA
29 May 2024
Targeting RNA-processing Vulnerabilities in Pancreatic Cancer



Dr. Li Chai
Harvard Medical School, USA
14 Jun 2024
Targeting an Oncofetal Protein SALL4 in Cancer

Dr. Mahmoud Bassal
Harvard Medical School, USA
20 Jun 2024
Narrow Width Genome Wide Regulatory Elements Provide a Fine Resolution Technology for Both Validation and Therapeutic Processes

Prof. Weiliang Zhu
Shanghai Institute of Material Medical Chinese Academy of Sciences, China
24 Jun 2024
Shanghai Institute of Material Medical Chinese Academy of Sciences, China
Developing New CADD Methods for Drug Discovery and Relocalization

Dr. Matthew N. McCall
University of Rochester Medical Center, USA
25 Jun 2024
Gene Regulatory Networks in Cancer: From Targeted Networks to Genome Scale Investigation

C. Seminars

Dr. Paul Liu
Translational and Functional Genomics Branch, National Human Genome Research Institute (NHGRI), USA
5 Jul 2024
Professor Yoshiaki Ito: Pioneer and Co-founder of the RUNX Research Field

Dr. Ichiro Taniuchi
RIKEN Center for Integrative Medical Sciences (IMS), Japan
5 Jul 2024
Roles of RUNX3 in Immune System

Prof. Kosei Ito
Nagasaki University, Japan
5 Jul 2024
Encounter and Struggle with RUNX3: A Journey with Prof. Yoshiaki Ito

Prof. Motomi Osato
Kumamoto University, Japan
5 Jul 2024
Enhancer for Runx1, eR1, in Hematopoietic and Other Tissue Stem Cells

Prof. Suk-Chul Bae
Chungbuk National University, South Korea
5 Jul 2024
Minimal Sufficient Molecular Events for Cancer Development

Dr. Li-Ren Kong
NUS Centre for Cancer Research (N2CR), NUS School of Medicine, Singapore
16 Jul 2024
Tumour Phenotypes and Intercellular Communication Fuel Cancer Drug Resistance

Dr. Claudio Bussi
Nanyang Technological University, Singapore
24 Jul 2024
Lysosomal Integrity and Its Role in Human Macrophage Function

Dr. Giorgio Bertolazzi
University of Palermo, Italy
8 Aug 2024
An Introduction to Processes and Statistics for Transcriptomics Analysis

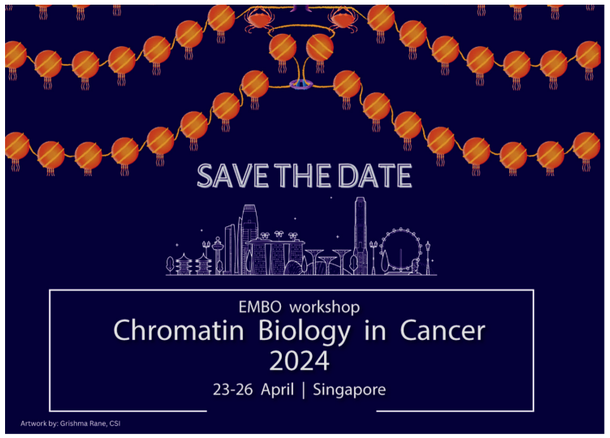
Dr. Yang Li
Cancer Science Institute of Singapore
17 Oct 2024
Advancing Protein and RNA structure Prediction through Co-evolutionary Analysis and Deep Learning.

Prof. Ernesto Guccione
Mount Sinai, USA
20 Nov 2024
Precision Medicine in Solid Tumors: New Tools and (some) New Ideas

D. Conferences & Symposiums

EMBO Workshop: Chromatin Biology in Cancer
23 – 26 Apr 2024

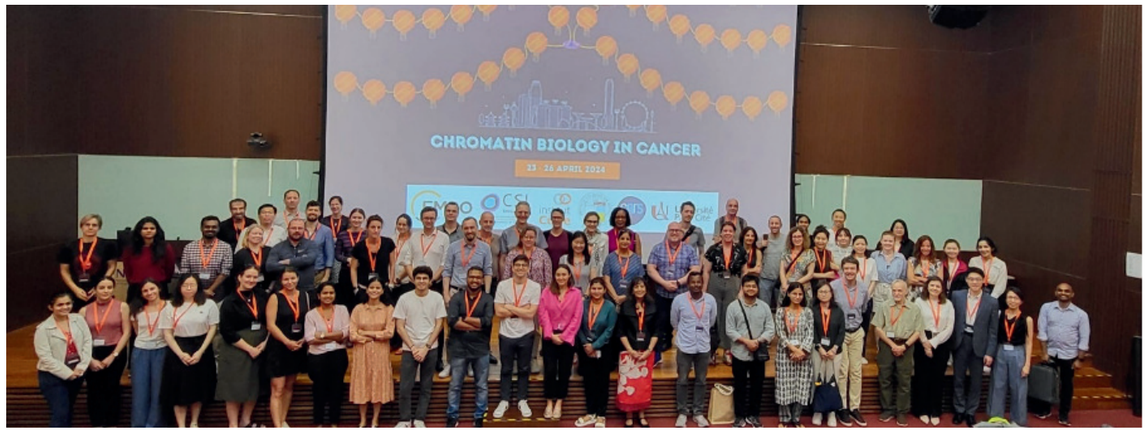
Cancer is a leading cause of death worldwide, accounting for ~10 million deaths in 2020. The number of cases increases as the population ages in regions such as Europe and Southeast Asia. It is a priority to tackle this burden, by developing better prognostic and therapeutic tools.



The past decades have greatly increased our knowledge of cancer biology. For instance, advances in sequencing technologies have revealed the complexity of the mutational landscape in tumors and shed light on the heterogeneity and clonal evolution of malignancies.

Besides these advances in genetics, a parallel revolution has occurred in cancer epigenetics. It has become overwhelmingly clear that epigenetic phenomena, in other words, phenomena that modify genome activity without modifying the underlying sequence, play key roles in cancer initiation and progression. While epigenetic abnormalities drive cancer, they also open new prognostic and therapeutic avenues.

The core objective of the EMBO Workshop on Chromatin Biology in Cancer 2024 is to bring together outstanding researchers, from all around the world, at all stages in the field of epigenetics/chromatin biology with a focus on cancer for the exchange of ideas and information.



EMBO Global Lecture Series 2024
26 Apr 2024

An Introduction to Processes and Statistics for Transcriptomics Analysis
8 Aug 2024

Frontiers in Cancer Science 2024
13–15 Nov 2024

The 16th Frontiers in Cancer Science (FCS) conference was held in Singapore from November 13–15, 2024, at The Matrix, Biopolis. Since its inception, FCS has grown into one of the most prominent cancer research events in the Asia-Pacific region, with over 600 delegates registered this year.

FCS 2024 attracted a diverse lineup of international and regional speakers, providing a platform for young investigators to showcase their research through posters. The conference also featured Oral Abstract Speaker sessions, where exceptional poster abstracts were selected for presentation. In addition, the two best poster presentations were awarded travel grants (worth $2,500 each) to support attendance at the AACR Annual Meeting in 2025. This marks the second consecutive year that 'Outstanding FCS Abstract Travel Awards,' were given to 10 international participants to help cover their expenses for attending FCS 2024. Awardees hailed from Australia, Canada, Ethiopia, Italy, Taiwan, South Korea, the United Kingdom, and the United States.

Since its launch in 2020, the AACR-FCS Education Sessions have been highly praised for their high participation rates and positive feedback. These sessions are designed to offer graduate students, post-doctoral researchers, and early-career investigators, an expanded view of contemporary cancer research. At FCS 2024, the AACR-FCS Education Sessions featured presentations from Katy Rezvani (MD Anderson Cancer Center, US), Sarah-Maria Fendt (VIB KU Leuven Center for Cancer Biology, Belgium), and Zemin Zhang (Peking University, China).

FCS 2024 was 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 (LKCMedicine), National Cancer Centre Singapore (NCCS), National University Cancer Institute, Singapore (NCIS), the Yong Loo Lin School of Medicine, NUS (YLLSoM) and Nanyang Technological University (NTU).

Publications

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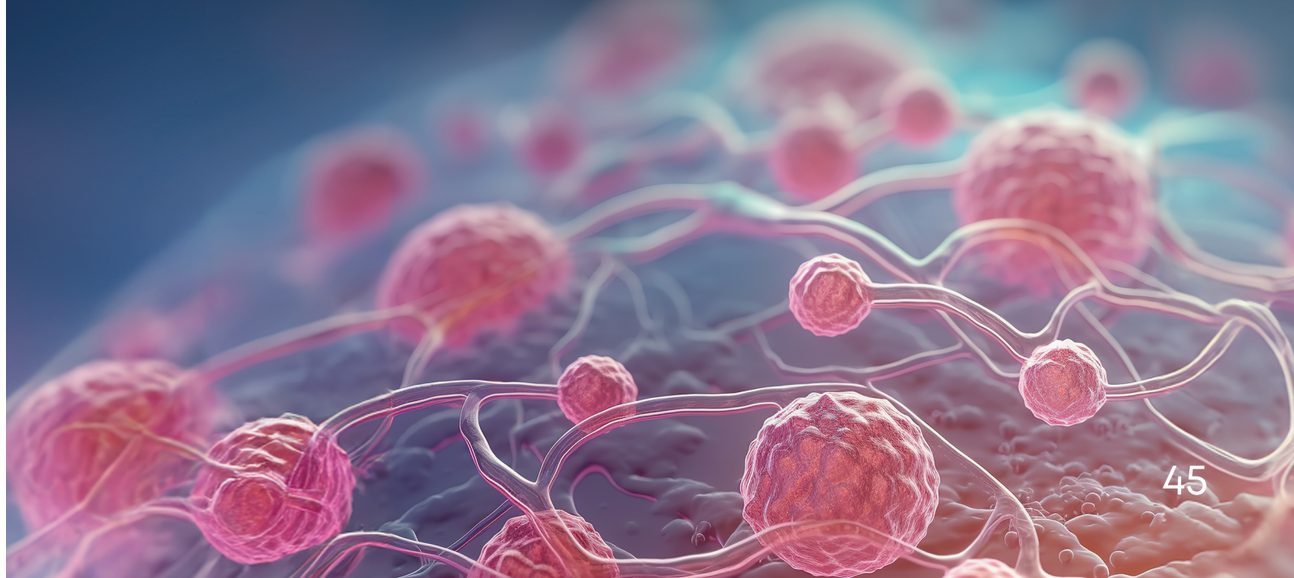

Publications

Authors	Title	Journal	Vol/Page	Date
Qiu K, Vu D, Wang L, Bookstaver A, Dinh TN, Goldfarb AN, **Tenen DG**, Trinh BQ.	Chromatin structure and 3D architecture define differential functions of PU.1 cis regulatory elements in human blood cell lineages	bioRxiv	Preprint	1/1/2024
Zheng W, Wuyun Q, Li Y, Zhang C, Freddolino PL, **Zhang Y.**	Improving deep learning protein monomer and complex structure prediction using DeepMSA2 with huge metagenomics data	Nature Methods	Online ahead of print	1/2/2024
Adine, Christabella; Fernando, Kanishka; Ho, Nicholas Ching Wei; Quah, Hong Sheng; Ho, Samantha Shu Wen; Wu, Kenny Zhuoran; Teng, Karen Wei Weng; Arcinas, Camille; Li, Ling; Ha, Kelly; Chew, Joey Wei Ling; Wang, Chenhui; Too, Nathaniel Sheng Hua; Yeong, Joe Poh Sheng; Tan, Daniel Shao Weng; Tan, Iain Bee Huat; Nagadia, Rahul; Chia, Claramae Shulyn; Macalinao, Dominique; Bhuvaneswari, Hariraman; Iyer, N. Gopalakrishna; **Fong, Eliza Li Shan**	Bioengineered hydrogels enhance ex vivo preservation of patient-derived tumor explants for drug evaluation	Biomaterials	305(3):122460	1/2/2024
Liu BH, Liu M, Radhakrishnan S, Jaladanki CK, Gao C, Tang JP, Kumari K, Go ML, Vu KAL, Seo HS, Song K, Tian X, Feng L, Tan JL, Bassal MA, Arthanari H, Qi J, Dhe-Paganon S, Fan H, **Tenen DG**, Chai L.	Targeting transcription factors through an IMiD independent zinc finger domain	bioRxiv	Preprint	1/3/2024
Tay WJ, **Jeyasekharan A**, Goh JY, Chang KTE, Kesavan A, Lee VK.	Aggressive prostate myxoid mesenchymal neoplasm with novel CRTC1::NCOA2 fusion	Histopathology.	Online ahead of print	1/3/2024
Perera AR, Warrier V, Sundararaman S, Hsiao Y, Ghosh S, Kularatnarajah L, **Pitt JJ.**	Melvin is a conversational voice interface for cancer genomics data	Communications Biology	7(1):30	1/5/2024

Publications

Authors	Title	Journal	Vol/Page	Date
Chengxin Zhang, Xi Zhang, Peter L Freddolino, **Yang Zhang**	BioLiP2: an updated structure database for biologically relevant ligand–protein interactions	Nucleic Acids Research	Volume 52, Issue D1	1/5/2024
Yang, Yi-Chi; Jiang, Qian; Yang, Ke-Ping; **Wang, Lingzhi;** Sethi, Gautam; Ma, Zhaowu	Extracellular vesicle-mediated ferroptosis, pyroptosis, and necroptosis: potential clinical applications in cancer therapy	Cell Death Discovery	10, 23 (2024)	1/12/2024
Wang, Rui; **Hussain, Aashiq**; Guo, Quan Quan; Jin, Xiao Wei; Wang, Miao Miao	Oxygen and Iron Availability Shapes Metabolic Adaptations of Cancer Cells	World Journal of Oncology	15(1):28-37	1/15/2024
Liany H, Jayagopal A, Huang D, Lim JQ, Nbh NI, **Jeyasekharan A**, Ong CK, Rajan V.	ASTER: A Method to Predict Clinically Relevant Synthetic Lethal Genetic Interactions	IEEE Journal of Biomedical and Health Informatics	Online ahead of print	1/16/2024
Ma W, Ahmad SAI, Hashimoto M, Khalilnezhad A, Kataoka M, Arima Y, Tanaka Y, Yanagi S, Umemoto T, **Suda T.**	MITOL deficiency triggers hematopoietic stem cell apoptosis via ER stress response	EMBO JOURNAL	Online ahead of print	1/18/2024
Suda K, Okabe A, Matsuo J, Chuang LSH, Li Y, Jangphattananont N, Mon NN, Myint KN, Yamamura A, So JB, Voon DC, Yang H, Yeoh KG, Kaneda A, **Ito Y.**	Aberrant upregulation of RUNX3 activates developmental genes to drive metastasis in gastric cancer	Cancer ResEARCH Communications	Online ahead of print	1/19/2024
Zhao S, Yang X, Zeng Z, Qian P, Zhao Z, Dai L, Prabhu N, Nordlund P, **Tam WL.**	Deep learning based CETSA feature prediction cross multiple cell lines with latent space representation.	(Nature) Scientific Reports	14(1):1878	1/22/2024
De Mel S, Lee AR, Tan JHI, Tan RZY, Poon LM, Chan E, Lee J, Chee YL, Lakshminarasappa SR, Jaynes PW, **Jeyasekharan AD.**	[Review] Targeting the DNA damage response in hematological malignancies	Frontiers in Oncology	14:1307839	1/29/2024

Publications

Authors	Title	Journal	Vol/Page	Date
Singhal V, Chou N, Lee J, Yue Y, Liu J, Chock WK, Lin L, Chang YC, Teo EML, Aow J, Lee HK, Chen KH, **Prabhakar S.**	BANKSY unifies cell typing and tissue domain segmentation for scalable spatial omics data analysis	Nature Genetics	56(3):431-441	2/1/2024
Ma W, Ahmad SAI, Hashimoto M, Khalilnezhad A, Kataoka M, Arima Y, Tanaka Y, Yanagi S, Umemoto T, **Suda T.**	MITOL deficiency triggers hematopoietic stem cell apoptosis via ER stress response	EMBO Journal	43(3):339-361	2/1/2024
Yang C, Yokomori R, Chua LH, Tan SH, Koh MY, Totani H, **Sanda T, Suda T.**	Deciphering the Regulatory Landscape of Murine Splenic Response to Anaemic Stress at Single-cell Resolution	Blood Advances	Online ahead of print	2/5/2024
García-Sancha N, Corchado-Cobos R, Blanco-Gómez A, Cunillera Puértolas O, Marzo-Castillejo M, Castillo-Lluva S, Alonso-López D, De Las Rivas J, Pozo J, Orfao A, Valero-Juan L, Patino-Alonso C, Perera D, **Venkitaraman AR**, Mao JH, Chang H, Mendiburu-Eliçabe M, González-García P, Caleiras E, Peset I, Cenador MBG, García-Criado FJ, Pérez-Losada J.	Cabergoline as a Novel Strategy for Post-Pregnancy Breast Cancer Prevention in Mice and Human	Research Square	Preprint	2/5/2024
Ali, Azhar	Advances in Non-Small Cell Lung Cancer (NSCLC) Treatment-A Paradigm Shift in Oncology	Pharmaceuticals	17(2), 246	2/13/2024
Iskandar, Kartini; Foo, Jonathan; Liew, Angeline Qiu Xia; Zhu, Haiyuxin; Raman, Deepika; **Hirpara, Jayshree L**.; Leong, Yan Yi; Babak, Maria V.; Kirsanova, Anna A.; Armand, Anne-Sophie; Oury, Franck; Bellot, Gregory; Pervaiz, Shazib	A novel MTORC2-AKT-ROS axis triggers mitofission and mitophagy-associated execution of colorectal cancer cells upon drug-induced activation of mutant KRAS	Autophagy	20(6), 1418–1441	2/25/2024

Publications

Authors	Title	Journal	Vol/Page	Date
Thng DKH, Hooi L, Siew BE, Lee KY, Tan IJ, Lieske B, Lin NS, Kow AWC, Wang S, Rashid MBMA, Ang C, Koh JJM, Toh TB, Tan KK, **Chow EK.**	A functional personalised oncology approach against metastatic colorectal cancer in matched patient derived organoids	NPJ Precision Oncology	8(1):52	2/27/2024
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