

N2CR INSIGHTS

THE QUARTERLY NEWSLETTER OF N2CR

LATEST NEWS AND ACHIEVEMENTS

Spotlight on Our Members: Recent Media Features

Magnetic Pulses Boost Breast Cancer Chemo



Photo credit: Institute for Health Innovation & Technology, NUS

A/Prof Alfredo Franco-Obregon, Dr Alex Tai Yee Kit & Viresh Krishnan Sukumar

Gold Nanoparticles: Latest in Cancer Treatment



Dr Andy Tay Kah Ping

Congratulations



PROF ASHOK VENKITARAMAN
DIRECTOR, NUS CENTRE FOR CANCER RESEARCH (N2CR)

**FELLOW OF AACR ACADEMY
CLASS OF 2025**

Grants Awarded by the National Medical Research Council (NMRC)



Dr Anand Jeyasekharan
Clinician Scientist Award (Senior Investigator Category)



Dr Stephen Chong
Open Fund - Young Individual Research Grant



Seminar with Prof Edison Liu

N2CR had the honour of welcoming Prof Edison Liu for an insightful seminar on 'Mapping Genes That Determine Immune Checkpoint Inhibitor Response in Cancer'.

Prof Liu, an expert in cancer biology and genomics, has authored over 320 scientific papers. His research focuses on the functional genomics of human cancers, particularly breast cancer, and the dynamics of gene regulation in cancer biology.

Thank you, Prof Edison Liu, for sharing your wisdom, expertise and knowledge with us.

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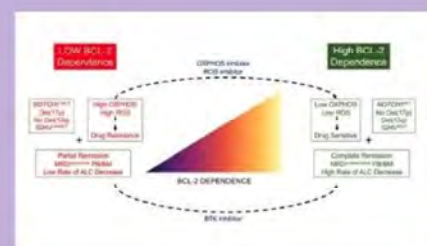
The tumour microenvironment (TME) plays a pivotal role in cancer progression, metastasis, and therapeutic resistance. Comprised of diverse cells, extracellular matrix, and signaling molecules, the TME drives processes like epithelial-mesenchymal transition (EMT), which enhance cancer cell invasiveness and metastasis. This review emphasises the need to therapeutically target TME components to disrupt its role in EMT and resistance mechanisms. By modulating the TME, emerging strategies aim to overcome therapeutic challenges and improve cancer treatment efficacy. Led by Dr Alan Prem Kumar, a member of N2CR, this article also explores current interventions and their limitations, offering a framework for developing innovative approaches to address cancer progression and resistance clinically.



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(Molecular Cancer; Stephen Jun Fei Chong, Junyan Lu ... Thorsten Zenz, Matthew Davids)

A multinational team of researchers, with first-author Dr Stephen Chong Jun Fei from N2CR, used BH3-profiling and various genetic and molecular data to find new treatment response markers. In 73 CLL patients, higher dependence on the BCL-2 protein was linked to better genetic markers and drug sensitivity. This was confirmed in cell studies and additional patients, showing BCL-2 dependence predicted positive treatment responses. BCL-2 dependence could be a useful marker for predicting CLL treatment response, helping to tailor therapies more effectively.



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(The Lancet Oncology; Wan Qin Chong, Jia Li Low, ... Yaw Chyn Lim, Boon Cher Goh)

A randomised clinical trial in Singapore, led by N2CR member Prof Goh Boon Cher and Dr Chong Wan Qin, compared the efficacy of pembrolizumab (a PD-1 inhibitor) alone versus in combination with bevacizumab (a VEGF inhibitor) in patients with platinum-resistant recurrent or metastatic NPC. The study involved 48 patients and found that the combination therapy significantly improved the objective response rate (58.3% vs. 12.5%). Although the combination also resulted in a higher incidence of vascular side effects (29% vs. 8%), these side effects were generally manageable. There were no severe or life-threatening side effects or treatment-related deaths in either group.

These findings, published in *The Lancet Oncology*, suggest that pembrolizumab combined with bevacizumab could be more effective than pembrolizumab alone, improving tumour response and potentially setting a new standard of care if validated in a phase 3 trial.

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RESEARCH NEWS (JAN - MAR 2025)

One Month of Brief Weekly Magnetic Field Therapy Enhances the Anticancer Potential of Female Human Sera

(Cells; Jan Nikolas Iversen, Yee Kit Tai, ... Abdul Jalil Rufaihah, Alfredo Franco-Obregon)



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Muscle is our first line of defence against cancer. A randomised clinical trial in Singapore, led by N2CR members A/Prof Alfredo Franco-Obregon & Dr Alex Tai Yee Kit, with N2CR graduate student Mr Viresh Krishnan Sukumar as part of the team, showed that one month of non-invasive magnetic therapy, applied to the legs of healthy women, was sufficient to condition their blood to combat breast cancer growth and development. Amazingly, blood taken one month after the last magnetic treatment exhibited the overall greatest anti-cancer potency.

Spatially Resolved, Tumour Ecosystems in Gastric Cancer Progression

(Cancer Discovery; Haoran Ma, Supriya Srivastava, ... Raghav Sundar, Patrick Tan)

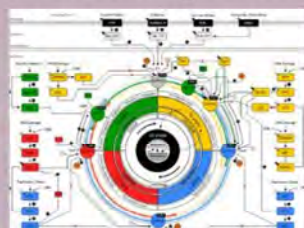
Gastric cancer (GC) has significant global mortality with high heterogeneity. A study of 226 GC samples from 121 patients integrated spatial transcriptomics and single-cell expression profiles, revealing extensive intratumour heterogeneity and spatially localised subgroups linked to specific immune environments and genetic drivers like SOX9. Two evolutionary trajectories, branched evolution and internal diaspora evolution, were identified, each associated with different molecular subtypes, clinical outcomes, and stromal neighbourhoods. Novel ecosystem states marked by increased GREM1 expression were highlighted. These findings from co-first author Dr Supriya Srivastava, a member of N2CR and the Singapore Gastric Cancer Consortium (SGCC), provide insights into how individual GC cellular ecosystems are shaped, resulting in personalised cancer cartographies for each patient.



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Cell Cycle Dysregulation in Cancer

(Pharmacological Reviews; Antonino Glaviano, Samarendra Singh, ... Aditya Bardia, Alan Prem Kumar)



A study led by Dr Alan Prem Kumar, a member of N2CR, delves into how cancer arises from disruptions in cell cycle regulation, driven by mutations that fuel unchecked division or disable critical control mechanisms such as apoptosis. Remarkably, tumours exploit functional checkpoints like DNA damage and mitotic checkpoints to persist despite accumulating genetic errors. Their study illuminates cutting-edge therapeutic strategies targeting these tumour dependencies, paving the way for innovative treatments to disrupt cancer progression and improve patient outcomes.

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WELCOMING OUR NEW GRADUATE STUDENTS

GET TO KNOW OUR GRADUATE STUDENTS!

NUS

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you got this

"Many chemotherapeutic drugs work by damaging the DNA of cancer cells, thereby either killing them or sending them into senescence - a state of permanent cell cycle arrest. However, some crafty cancers are able to defy senescence and escape back into the state of uncontrolled cell division. My research aims to better understand this paradoxical phenomenon and also investigate any role that the cytoskeleton might play in it."

TIMOTHY LOPEZ

IMPORTANT

TEO MIN SHEEN

"I hope to explore new therapeutic options for cancer and gain a better understanding of how our bodies function, particularly the complex interplay between the body and cancer. There is still so much we don't know, and I hope my work can contribute a small piece to the puzzle of science and bring meaning to challenging moments."

PhD

"I've always been driven by research that directly impacts patients' lives. Currently, I'm exploring how cancer-related mutations—such as p53 and oncogenes—disrupt DNA repair pathways, accelerating cancer progression. Unraveling these mechanisms could lead to new therapeutic targets and, ultimately, more effective treatments."

FAITH HOW