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ASIA EDITION

Accelerating Cancer Treatment with Precision Medicine & NGS

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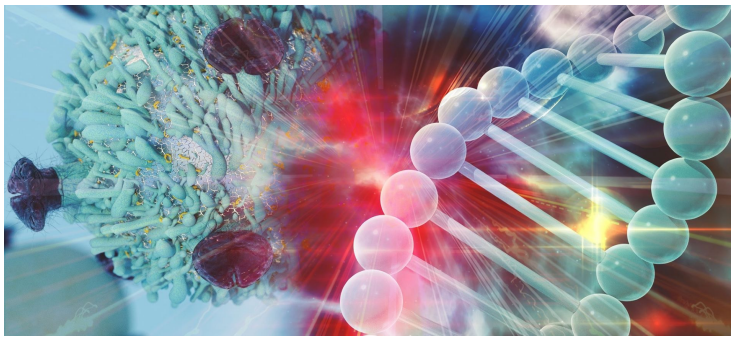
Asia accounts for nearly half of global cancer cases, making it a major health concern. Recognising the promise of precision oncology, governments across the region have initiated efforts to drive advancements in this space. Let's take a closer look at the progress being made in precision oncology in the Asia Pacific region.



Cancer is inherently diverse, with significant variations both between different tumours and among individuals. This variability extends across the globe, with certain cancers—such as head and neck cancers—being more common in Southeast and East Asia than in Western countries.

A study published in The Lancet reveals differences in lung cancer between Caucasian and Asian populations. These disparities extend across various factors, including epidemiology, genomics, standard therapies, and outcomes, all influenced by geographic and ethnic variations. Such differences play a key role in determining the most effective treatment for patients.

Understanding the genetic underpinnings of cancer is vital for advancing precision oncology, which tailors treatments based on an individual's genetic makeup. Beyond improving patient outcomes, genomic profiling has the potential to save healthcare systems billions by eliminating ineffective treatments, making healthcare more affordable and sustainable. An Australian study underscores these benefits, demonstrating how this approach can significantly reduce unnecessary prescriptions and lower healthcare costs.

Many countries have therefore launched initiatives to explore and understand the genetic foundations of cancer, aiming to revolutionise how we treat this dreaded disease.

Leading among them, Singapore has launched a 10-year national precision medicine research roadmap to accelerate biomedical research, improve health outcomes, and create economic opportunities across various sectors. As part of this initiative, two multi-institutional and multidisciplinary teams of clinician-scientists and researchers have each been awarded S$25 million in grants by the Singapore Ministry of Health through the National Medical Research Council (NMRC) Office and MOH Holdings Pte Ltd, under the NMRC Open Fund-Large Collaborative Grant (OF-LCG) programme. The S$50 million in total funding supports the SYMPHONY 2.0 and Colo-SCRIPT research programmes, which aim to advance precision oncology research in Singapore, focusing on improving the understanding, diagnosis, and treatment of lymphoma and colorectal cancer.

Australia is also very active in driving the precision medicine movement. The Australian Genomic Cancer Medicine Program (AGCMP) focuses on improving health outcomes for patients with less common, high-mortality cancers, including ovarian, and pancreatic cancer, sarcomas and cancer metastasis. Australia also launched the Precision Oncology Screening Platform Enabling Clinical Trials (PrOSPeCT), which will sequence the genomes of more than 20,000 cancer patients, many

with rare and challenging tumours. The $185 million AUD (about $127 million) project will unite Australian federal and state governments, hospitals, research organisations, and biopharma companies to direct patients to targeted therapies and clinical trials and advance promising new treatments.

The government in South Korea-led K-MASTER project created a comprehensive database of genomic data from 10,000 cancer patients. This resource supports healthcare professionals in cancer diagnosis and treatment.

Similarly the government in Thailand has established the Genomics Thailand Initiative, a collaborative research network designed to advance precision medicine in the country.

In Japan, the National Cancer Center Japan (NCC), Precision Medicine Asia (PREMIA), and Paradigm Health Inc. have launched the LC-SCRUM-CD (Lung Cancer Genome Screening Project for Individualised Medicine-Clinical Development). This nationwide clinical trial network, which includes over 150 hospitals through the LC-SCRUM-Asia initiative, aims to advance precision medicine for cancer patients by leveraging cancer genomic screening.

The Taiwan Precision Medicine Initiative (TPMI) seeks to gather genetic data from around one million individuals to develop a risk assessment model for common diseases including cancer.

Meanwhile, in India, the GenomeIndia Project, aims to sequence 10,000 genomes from healthy individuals across the country. This initiative seeks to create a comprehensive genomic database to support personalised healthcare solutions.

Collaborative forces driving precision medicine

To promote cancer prevention globally and to provide evidence-based recommendations through the development of Regional Codes Against Cancer, the International Agency for Research on Cancer (IARC/WHO) and its partners launched the World Code Against Cancer Framework in 2022. As part of its consolidation of priorities to address gaps in cancer control in 2021, the Asian National Cancer Centers Alliance (ANCCA) recognised the importance of developing a set of cancer prevention recommendations for Asia.

Members of the ANCCA are working towards creating an Asian Code Against Cancer (ACAC). The goal is to develop a comprehensive code with sub-chapters that address the diverse populations across Asia, following the rigorous scientific review process outlined in the IARC/WHO World Code Against Cancer Framework.

Several cross-country projects are advancing cancer research in Asia. One such initiative is the A-TRAIN project, launched by the National Cancer Center Hospital Japan. This international study, involving eight Asian countries (Japan, Korea, Malaysia, Philippines, Singapore, Taiwan, Thailand, and Vietnam), aims to develop novel treatments based on genomic abnormalities for cancers common in Asia. The project focuses on cervical cancer, ovarian cancer, nasopharyngeal carcinoma, endometrial cancer, and breast cancer. It will build and analyse a comprehensive database by examining genomic abnormalities through liquid biopsy, alongside clinical information such as treatment details and patient prognosis.

The other one, the Quad Cancer Moonshot is a groundbreaking collaboration between the United States, Australia, India, and Japan. The initiative aims to combat cancer, starting with cervical cancer—a largely preventable but still major health issue in the Indo-Pacific region. The Moonshot will lay the groundwork for addressing other forms of cancer by strengthening the region’s cancer care ecosystem, improving health infrastructure, expanding research collaborations, building data systems, and enhancing support for cancer prevention, detection, treatment, and care.

In addition to these government-led efforts, industry-academic collaborations are also advancing precision oncology. The University of Melbourne has teamed up with global biomedical company Illumina to integrate next-generation sequencing (NGS) technology with research expertise, aiming to move genomics from the lab into routine clinical care. Furthermore, the university has signed a memorandum of understanding (MoU) with the Peter MacCallum Cancer Centre to establish a new center dedicated to transforming how genomics and precision oncology are delivered in Australia.

Developing Asian specific solutions

Molecular diagnostic assays are essential for personalised care, serving as the first step in treatment planning. However, many of these tests are based on biomarkers and genetic data derived from Western populations, creating a gap in addressing the unique genetics of the Asian population.

To improve access to affordable, advanced genomic testing for cancer in Singapore, Thermo Fisher Scientific, the National University Hospital (NUH), and Mirxes, a Singapore-based RNA technology company, have signed a MoU. This collaboration aims to develop and clinically validate NGS solutions and cancer research tailored to the unique needs of the Southeast Asian population.

Gencurix, a Korean company, has developed GenesWellBCT, Asia's first prognostic diagnostic test for breast cancer. Unlike most Western tests, which conduct clinical trials in Western countries, GenesWellBCT has been validated through multiple trials focused on Asian patients. This test is the first of its kind in Asia to receive national government approval, and Gencurix plans to expand into the Japanese market based on these positive results. Several other companies are also developing diagnostic tests specifically for the South Asian population.

As research in genomics and personalised medicine advances, we continue to unravel the complexities of this elusive disease and will be able to treat cancer just like any other illness.

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