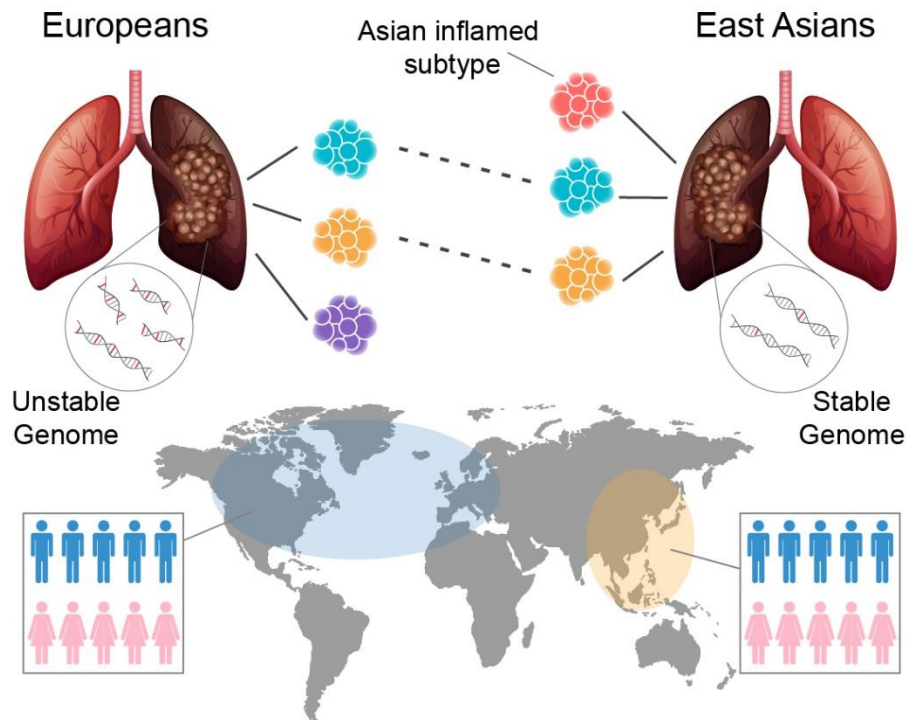


**MEDIA RELEASE**  
**FOR IMMEDIATE RELEASE**

**19 MAY 2020**

**BREAKTHROUGH STUDY REVEALS GENE DRIVERS SPECIFIC TO ASIAN LUNG  
CANCERS**

***New data on East Asian populations will guide researchers and clinicians to  
develop novel therapeutic strategies tailored to individual lung cancer patients***



*LUADs in East Asians show a novel inflamed sub-type and more stable genomes compared with those in Europeans (Copyright: A\*STAR's Genome Institute of Singapore)*

**SINGAPORE** – Singapore scientists have completed one of the largest comprehensive genome studies of Asian lung adenocarcinoma (LUAD). Findings from this landmark study, which were published in February 2020's issue of [Nature Genetics](#), are expected to contribute to the development of personalised medicine for lung cancer treatment and prevention. The study was led by scientists from A\*STAR's Genome Institute of Singapore

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(GIS), in collaboration with the National Cancer Centre Singapore (NCCS), and the Lung Cancer Consortium Singapore (LCCS)<sup>1</sup>.

Worldwide, LUAD is the most common type of lung cancer, and is responsible for over one million deaths annually<sup>2,3</sup>. It differs markedly between Asians and Europeans as Asian LUAD patients tend to be female, non-smokers, and have more mutations in an important gene known as EGFR<sup>4</sup>. Past studies by GIS and NCCS have also revealed that Asian lung cancers have higher level of heterogeneity than their European counterparts<sup>5</sup>.

## **Findings**

In this study, an inter-disciplinary team of researchers built on the donated clinical samples curated by the LCCS, and sequenced and analysed the largest dataset of LUADs for East Asians (including Singaporeans who formed the majority). The study revealed that the tumour mutation landscape in Asian patients is very unique, and several new genes may be implicated in the development of lung cancers in Asians.

One striking discovery from this study is a unique sub-group of lung tumours that appears specific to Asian lung cancers. This sub-group of lung tumours is more inflammatory in Asian patients compared to European patients, and contains high amounts of immune cells. Considering the increasing use of immunotherapy in cancer treatments, this discovery may lead to a more accurate selection of lung cancer patients who can benefit from this form of treatment.

The comprehensive analyses of the genetic and molecular features of these tumours have provided researchers and clinicians a vista to assess the fingerprint of each lung cancer tumour. Such genomic information will deepen their understanding on how individual patients might respond differently to drug treatments, thus enabling a more precise approach to treating patients in the future. Data from this study is now publicly available via the [Singapore Oncology Data Portal \(OncoSG\)](#) which enables integration, visualisation, analyses, and sharing of cancer genomics datasets in Singapore<sup>6</sup>.

Prof Zhai Weiwei, a principal investigator at GIS and senior author of the study, noted, “This study depicted a comprehensive genomic landscape of Asian LUADs, and characterised the complex ethnic differences between Asians and Europeans.”

A/Prof Daniel Tan, Senior Clinician Scientist at GIS and Senior Consultant Medical Oncologist at NCCS, said, “Our study highlights how such deep genetic analysis can improve our ability to predict the behaviour of lung cancers beyond traditional clinical parameters, providing new perspectives in tailoring treatment approaches”.

Prof Patrick Tan, Executive Director of GIS, said, “The findings may lead to new patient stratification approaches to provide better personalised treatment options. Novel therapies may also be developed by combining existing therapies with immunotherapy targeting Asian-specific sub-groups.”

– END –

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**Enclosed:**

**ANNEX A** – Notes to Editor on Research Findings

**ANNEX B** – References

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### **About A\*STAR's Genome Institute of Singapore (GIS)**

The Genome Institute of Singapore (GIS) is an institute of the Agency for Science, Technology and Research (A\*STAR). It has a global vision that seeks to use genomic sciences to achieve extraordinary improvements in human health and public prosperity. Established in 2000 as a centre for genomic discovery, the GIS will pursue the integration of technology, genetics and biology towards academic, economic and societal impact.

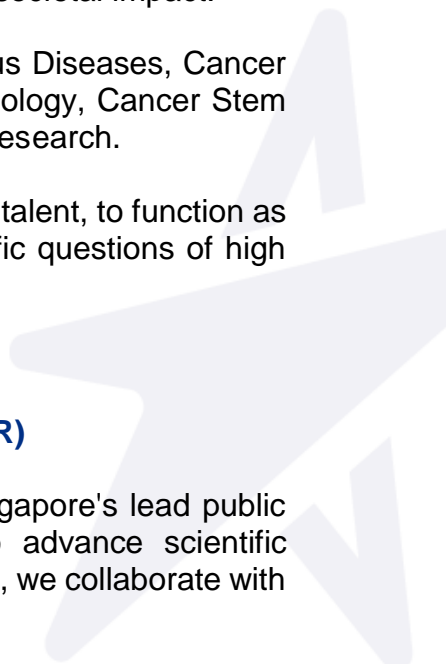
The key research areas at the GIS include Human Genetics, Infectious Diseases, Cancer Therapeutics and Stratified Oncology, Stem Cell and Regenerative Biology, Cancer Stem Cell Biology, Computational and Systems Biology, and Translational Research.

The genomics infrastructure at the GIS is utilised to train new scientific talent, to function as a bridge for academic and industrial research, and to explore scientific questions of high impact.

For more information about GIS, please visit [www.a-star.edu.sg/gis](http://www.a-star.edu.sg/gis).

### **About the Agency for Science, Technology and Research (A\*STAR)**

The Agency for Science, Technology and Research (A\*STAR) is Singapore's lead public sector R&D agency, spearheading economic-oriented research to advance scientific discovery and develop innovative technology. Through open innovation, we collaborate with our partners in both the public and private sectors to benefit society.



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We play a key role in nurturing and developing a diversity of talent and leaders in our Agency and research entities, the wider research community and industry. A\*STAR's R&D activities span biomedical sciences and physical sciences and engineering, with research entities primarily located in Biopolis and Fusionopolis. For ongoing news, visit [www.a-star.edu.sg](http://www.a-star.edu.sg).

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National Cancer Centre Singapore (NCCS) provides a holistic and multi-disciplinary approach to cancer treatment and patient care. We treat almost 70 per cent of the public sector oncology cases, and they are benefiting from the sub-specialisation of our clinical oncologists. To deliver among the best in cancer treatment and care, our clinicians work closely with our scientists who conduct robust cutting-edge clinical and translational research programmes which are internationally recognised. NCCS strives to be a global leading cancer centre, and shares its expertise and knowledge by offering training to local and overseas medical professionals. [www.nccs.com.sg](http://www.nccs.com.sg)



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## **ANNEX A – NOTES TO EDITOR**

The research findings described in this media release can be found in the scientific journal Nature Genetics, under the title, "[Genomic landscape lung adenocarcinoma in East Asians](#)" by Jianbin Chen<sup>1</sup>, Hechuan Yang<sup>1,2</sup>, Audrey Su Min Teo<sup>1</sup>, Lidyana Bte Amer<sup>1</sup>, Faranak Ghazi Sherbaf<sup>1</sup>, Chu Quan Tan<sup>1</sup>, Jacob Josiah Santiago Alvarez<sup>1</sup>, Bingxin Lu<sup>1</sup>, Jia Qi Lim<sup>1</sup>, Angela Takano<sup>3</sup>, Rahul Nahar<sup>1</sup>, Yin Yeng Lee<sup>1</sup>, Cheryl Zi Jin Phua<sup>1</sup>, Khi Pin Chua<sup>1</sup>, Lisda Suteja<sup>4</sup>, Pauline Jieqi Chen<sup>1</sup>, Mei Mei Chang<sup>1</sup>, Tina Puay Theng Koh<sup>5</sup>, Boon-Hean Ong<sup>6</sup>, Devanand Anantham<sup>7</sup>, Anne Ann Ling Hsu<sup>7</sup>, Apoorva Gogna<sup>8</sup>, Chow Wei Too<sup>8</sup>, Zaw Win Aung<sup>9</sup>, Yi Fei Lee<sup>1,13</sup>, Lanying Wang<sup>9</sup>, Tony Kiat Hon Lim<sup>3</sup>, Andreas Wilm<sup>1</sup>, Poh Sum Choi<sup>1</sup>, Poh Yong Ng<sup>1</sup>, Chee Keong Toh<sup>4</sup>, Wan-Teck Lim<sup>4,14</sup>, Siming Ma<sup>1</sup>, Bing Lim<sup>1</sup>, Jin Liu<sup>10</sup>, Wai Leong Tam<sup>1,11,12,13</sup>, Anders Jacobsen Skanderup<sup>1</sup>, Joe Poh Sheng Yeong<sup>3,14</sup>, Eng-Huat Tan<sup>9,4</sup>, Caretha L. Creasy<sup>15</sup>, Daniel Shao Weng Tan<sup>1,4,16,\*</sup>, Axel M. Hillmer<sup>1,17,\*</sup>, Weiwei Zhai<sup>1,2,13,18,\*</sup>

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## **ANNEX B – REFERENCES**

1. The LCCS was set up in 2007 to bring together the academic and clinical community to improve our understanding of the underpinnings of Asian lung cancer with the funding support from various sources – including Singapore Cancer Syndicate, National Research Foundation Singapore, NCC Research Fund, TrailBlazer Foundation, Singapore Millennium Foundation as well as contribution from industrial partners. Since 2013, research to address this important medical challenge has been supported by the National Research Foundation Singapore and administered by the Singapore Ministry of Health’s National Medical Research Council under the Translational and Clinical Research (TCR) Flagship Programme and Open Fund – Large Collaborative Grant (OF-LCG).
2. Bray F. et al. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA. Cancer J. Clin. 68(6):394-424, (2018).
3. Daniel S.W. Tan, et al. Cancer Genomics: Diversity and Disparity Across Ethnicity and Geography. J Clin Oncol. 34(1):91-101 (2016)
4. <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/epidermal-growth-factor-receptor>
5. Nahar R. et al. Elucidating the genomic architecture of Asian EGFR-mutant lung adenocarcinoma through multi-region exome sequencing. Nat Commun. 9:216 (2018)
6. [https://src.gisapps.org/OncoSG\\_public/study/summary?id=GIS031](https://src.gisapps.org/OncoSG_public/study/summary?id=GIS031)

