

MEDIA RELEASE
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**GIS, NUS, AND NOVO NORDISK TEAM UP TO STUDY NON-ALCOHOLIC
FATTY LIVER DISEASE IN ASIAN POPULATIONS**

New study will generate insights in the development and progression of the disease in Asia, which could support the development of effective diagnostics and therapies.



From left: Prof Ng Huck Hui (Co-Principal Investigator of this research programme and Assistant Chief Executive of A*STAR's Biomedical Research Council), Prof Patrick Tan (Executive Director of GIS), Dr Karin Conde-Knape (Corporate Vice President at Novo Nordisk), Dr Ivan Formentini (Vice President at Novo Nordisk), and Assoc Prof Dan Yock Young (Co-Principal Investigator of this research and Head of the Department of Medicine at NUS Medicine). Photo taken at the EMULSION-Novo Nordisk Asian Biomarker Laboratory (ENABL). (Copyright: A*STAR's Genome Institute of Singapore)

SINGAPORE – The Agency for Science, Technology and Research's (A*STAR's) Genome Institute of Singapore (GIS), and the National University of Singapore (NUS)'s Yong Loo Lin School of Medicine (NUS Medicine) have entered a strategic research collaboration with global healthcare company Novo Nordisk, to enhance the understanding of non-alcoholic fatty liver disease (NAFLD), and its more severe form, non-alcoholic steatohepatitis (NASH). The study aims to discover new molecular hallmarks and biomarkers of the disease specific to Asian populations, which could lead to the development of effective treatment strategies.

NAFLD is one of the most common causes of liver disease. It is characterised by the building up of fat in the livers of people who consume little to no alcohol, and is often associated with obesity and type 2 diabetes. Over time, NAFLD can progress to a more severe form of the disease called NASH, in which liver scarring and inflammation sets in. NAFLD affects more than a quarter of the global adult population¹, and is estimated to affect up to one third of the adult Singapore population².

There are currently no approved therapies for treating NAFLD/NASH, and the first-in-line treatment recommendations are dietary and lifestyle changes, due to the disease's close association with obesity. While Asian and Western NAFLDs share several characteristics, Asian NAFLD is characterised by a lower body mass index³, younger age, increased complication rate and higher prevalence in lean individuals^{2,3}. Hence, there is a significant need for further research on Asian populations to develop effective diagnostics and therapies.

The research collaboration will contribute to the understanding of a Singaporean- and Asian-centric NAFLD as part of a national research platform named Ensemble of Multi-disciplinary Systems and Integrated Omics for NAFLD (EMULSION). As co-hosts of EMULSION, GIS and NUS Medicine will unite global industry and academic research efforts to build an Asian-centric NAFLD database. These efforts will build upon the contributions by physicians at the NAFLD clinics in Singapore hospitals, as well as GIS and NUS Medicine scientists. Also contributing to this database are MedTech imaging companies HistoIndex, an A*STAR spin-off that provides an automated and accurate quantification of NAFLD/NASH characteristics in liver biopsies with its AI-based stain-free digital pathology platform; and Perspectum Diagnostics, a spin-off from Oxford University that has developed Liver*MultiScan* — a non-invasive MR imaging test to help identify NASH patients.

Professor Patrick Tan, Executive Director of GIS, commented, “Currently, there are no approved non-invasive diagnostic tests for NAFLD and NASH. This research on an Asian cohort provides a unique opportunity to identify common and divergent disease drivers of Asian and Western NAFLDs. Consequently, it can also potentially result in alternatives to invasive biopsy in the future.”

“Non-alcoholic fatty liver is increasing in incidence in Asia and very little is understood about the disease in our multi-ethnic population,” remarked Associate Professor Dan Yock Young, the Lead Principal Investigator of this research and Head of the Department of Medicine at NUS Medicine. “This grant and collaboration with our strategic partners offers us the opportunity to drill into

¹[Younossi Z, Tacke F, Arrese M, et al. \(2019\) Global perspectives on non-alcoholic fatty liver disease and non-alcoholic steatohepatitis. *Hepatology* 69\(6\):2672. doi:10.1002/hep.30251.](#)

²[Aslam F, Kazimianec A, Banerjee R, Bryant JA, Chin CWL. \(2019\) Prevalence of NAFLD in a Singaporean cohort using non-invasive multiparametric MRI. *Singapore Hepatology Conference*, 7-8 June](#)

³[Wilman HR, Kelly M, Garratt S, Matthews PM, Milanese M, Herlihy A, et al. \(2017\) Characterisation of liver fat in the UK Biobank cohort. *PLoS ONE* 12\(2\): e0172921. doi:10.1371/ journal.pone.0172921](#)

the pathophysiology of the Asian phenotype and to develop better screening, diagnostic, predictive and effective therapies that can avert the complications of this disease for Asians.”

Dr Karin Conde-Knappe, Corporate Vice President at Novo Nordisk commented, “We are very excited to start this collaboration as we believe it will bring us one step closer to understand key drivers in the pathophysiology of NAFLD and NASH, and potentially help us in identifying promising biomarkers for diagnosis and disease progression.”

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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.

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.

As a Science and Technology Organisation, A*STAR bridges the gap between academia and industry. Our research creates economic growth and jobs for Singapore, and enhances lives by contributing to societal benefits such as improving outcomes in healthcare, urban living, and sustainability.

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/.

About the National University of Singapore (NUS)

The National University of Singapore (NUS) is Singapore's flagship university, which offers a global approach to education, research and entrepreneurship, with a focus on Asian perspectives and expertise. We have 17 faculties across three campuses in Singapore, as well as 12 NUS Overseas Colleges across the world. Close to 40,000 students from 100 countries enrich our vibrant and diverse campus community.

Our multidisciplinary and real-world approach to education, research and entrepreneurship enables us to work closely with industry, governments and academia to address crucial and complex issues relevant to Asia and the world. Researchers in our faculties, 29 university-level research institutes, research centres of excellence and corporate labs focus on themes that include energy, environmental and urban sustainability; treatment and prevention of diseases common among Asians; active ageing; advanced materials; as well as risk management and resilience of financial systems. Our latest research focus is on the use of data science, operations research and cybersecurity to support Singapore's Smart Nation initiative.

For more information on NUS, please visit www.nus.edu.sg.

About the NUS Yong Loo Lin School of Medicine (NUS Medicine)

Established in 1905, the NUS Yong Loo Lin School of Medicine is the first institution of higher learning in Singapore and the genesis of the National University of Singapore.

The School offers one of the finest undergraduate medical programmes in the Asia Pacific region and enjoys international recognition and respect. The Times Higher Education World University Rankings 2019 by subject and Quacquarelli Symonds (QS) World University Rankings by Subject 2019 list NUS Medicine as the leading medical school in Asia.

It admits 300 students to the MBBS degree programme annually and its principal missions are to educate and train the next generation of healthcare professionals, and foster research that will help to advance the practice of medicine.

The 18 NUS Medicine departments in the basic sciences and clinical specialties work closely with the Centre for Medical Education, the Centre for Biomedical Ethics, the Centre for Healthcare Simulation as well as the restructured public hospitals to ensure that teaching and research are aligned and relevant to Singapore's healthcare needs. The School is a founding institutional member of the National University Health System.

For more information about NUS Medicine, please visit <http://nusmedicine.nus.edu.sg>.

About Novo Nordisk

Novo Nordisk is a global healthcare company with more than 95 years of innovation and leadership in diabetes care. This heritage has given us experience and capabilities that also enable us to help people defeat obesity, haemophilia, growth disorders and other serious chronic diseases. Headquartered in Denmark, Novo Nordisk employs approximately 42,200 people in 80 countries and markets its products in more than 170 countries. For more information, visit novonordisk.com, Facebook, Twitter, LinkedIn, YouTube.