**NEWS RELEASE**

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# Mould issue at Gaia due to condensation and rain, not the timber, say two independent experts

Gaia, which is constructed from Mass Engineered Timber (MET) and located at **Nanyang Technological University, Singapore (NTU Singapore)**, was recently reported to have issues of mould in some rooms and on the exterior of the building.

Two independent experts assessed the building this week and concluded that condensation and exposure to rain were the primary causes of the mould issue at Gaia.

**Associate Professor Tham Kwok Wai,** a global expert in Indoor Air Quality, Ventilation, and Engineering Control for Mitigation of Airborne Disease Transmission, chairs the National Committee on Code of Practice for Indoor Air Quality for Air-Conditioned Buildings, and Enterprise Singapore's Technical Committee for Chemical and Biological Sciences, under the Ministry of Trade and Industry.

Assoc Prof Tham said: "Moulds are the longest surviving and thriving biological species with millions of years of survival instincts. They will sporate more when they are under threat. For example, opening windows will cause them to grow faster as they detect a change in temperature and feel threatened."

The mould was mostly found on the air-conditioning supply grilles and furniture surfaces in the affected rooms. Condensation occurs when the external humid air comes into contact with cooler indoor surfaces, such as when windows and doors of the offices are opened for prolonged periods.

Assoc Prof Tham said that the MET used in Gaia's construction did not contribute to the mould growth, as the timber meets certified regulatory standards and is treated with protective sealants.

**Associate Professor Shinya Okuda**, an expert in the use of timber in buildings and an award-winning architect, agreed with this. Both professors are from the College of Design and Engineering at the National University of Singapore and were not involved in the Gaia project.

He said: “Mould growth can occur under consistently high relative humidity, prolonged rain exposure, or condensation in tropical environments. More porous surfaces are prone to mould growth, regardless of material – timber or concrete – if untreated. The timber elements of Gaia are coated to reduce porosity, which should help mitigate mould growth. However, coatings generally require periodic maintenance.

“The mould growth observed on the exterior timber cladding is due to exposure to direct rain, but the trial sanding that I saw on site shows that mould has not penetrated the timber structure. The long-term mitigation of mould growth involves maintaining a drier environment, reducing condensation and limiting direct rain exposure overall.”

Assoc Prof Tham added that mould is pervasive in Singapore due to its warm tropical climate and can grow on any surface if the environment is conducive, such as in dark, damp, and poorly ventilated areas.

He recommended several sustainable maintenance approaches, all of which NTU has accepted and will implement.

**Mould removal and prevention**

**NTU Chief Development & Facilities Management Officer, Mr Siew Hoong Kit,** said that the health and well-being of the NTU community is paramount and the University is committed to address the mould issue in Gaia through daily cleaning, periodic maintenance, and mould remediation efforts.

“We want to provide a safe environment for our faculty, staff and students working and studying at Gaia, and have taken immediate steps to remediate the rooms and facilities affected by mould. Our measures will also include comprehensive air quality assessments and we will adopt the maintenance regime recommended by Assoc Prof Tham,” Mr Siew said.

In the next three weeks, rooms and spaces at Gaia that are affected by mould will undergo chemical cleaning, followed by mould testing, to ensure the mould is eradicated. To minimise the resurgence of mould, daily wiping of the air-conditioning supply grilles in all rooms will be carried out, as these are areas prone to condensation.

Spaces and corners that have low airflow will be cleaned monthly. Both exterior and interior building surfaces, including structural pillars, will be inspected, cleaned, and maintained regularly.

Any visible cracks in wood surfaces will also be patched and resealed to prevent moisture penetration and subsequent mould growth.

## Health and comfort

Respiratory disease and immunology experts said that as the immune system normally clears any inhaled fungal spores, healthy individuals with normally functioning immune systems are unlikely to experience issues with mould exposure.

**Associate Professor Sanjay Chotirmall**, **Vice Dean (Research), Lee Kong Chian School of Medicine (LKCMedicine)**, said**:** “Not unique to any one building, our humid weather in the tropics does promote fungal growth. Those at higher risk of health-related consequences are usually those with underlying lung disease or allergies including asthma, and those with compromised immune systems, such as patients receiving long-term steroid treatment or chemotherapy for cancer.”

**Assistant Professor Loh Jia Tong** from the **NTU School of Biological Sciences,** added: “Mould releases spores, which may cause the immune system of predisposed individuals to overreact. With the deep cleaning and eradication of the mould, most healthy occupants should not experience any issues, especially with the daily maintenance that will inhibit mould growth.”

NTU also plans to activate the air conditioning system ahead of classes and working hours in the morning to help ventilate the rooms and reduce any potential odours, ensuring a comfortable environment for students and staff.

NTU's central air conditioning provides cooled, dehumidified and filtered outdoor air to meet ventilation requirements. This mixes with the room air which the indoor air-conditioning system maintains at a consistent indoor temperature for thermal comfort.

Users are reminded not to open the windows and doors for prolonged periods as doing so will potentially carry external moulds indoors, cause condensation and lead to the proliferation of mould.

These adjustments will be calibrated carefully to ensure sustainable energy consumption.

## About Gaia

Supported by Singapore’s Building and Construction Authority (BCA), NTU is a pioneer in the use of mass engineered timber in the tropics.

A winner of several international architecture and sustainable building awards, Gaia received the highest Green Mark Platinum (Zero Energy) certification. It produces

some 2,500 fewer tonnes of carbon dioxide (CO2) per year as compared to conventional buildings, which is equivalent to more than 7,000 roundtrip flights from Singapore to Hong Kong.

It also has solar photovoltaic (PV) panels installed on the rooftop which generates 516,000 kilowatt hours (kWh) of clean energy to power the building while its air-conditioning system saves energy by using passive cooling coils to chill the air without the use of fans.

NTU recognises that being a pioneer also means undertaking some inherent risks and moving into unchartered areas.

“We will learn from these challenges and share our learning and best practices as more buildings are constructed using MET in Singapore and other parts of the tropics,” said Mr Siew.

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***About Nanyang Technological University, Singapore***

A research-intensive public university, Nanyang Technological University, Singapore (NTU Singapore) has 35,000 undergraduate and postgraduate students in the Business, Computing & Data Science, Engineering, Humanities, Arts, & Social Sciences, Medicine, Science, and Graduate colleges.

NTU is also home to world-renowned autonomous institutes – the National Institute of Education, S Rajaratnam School of International Studies and Singapore Centre for Environmental Life Sciences Engineering – and various leading research centres such as the Earth Observatory of Singapore, Nanyang Environment & Water Research Institute and Energy Research Institute @ NTU (ERI@N).

Under the NTU Smart Campus vision, the University harnesses the power of digital technology and tech-enabled solutions to support better learning and living experiences, the discovery of new knowledge, and the sustainability of resources.

Ranked amongst the world’s top universities, the University’s main campus is also frequently listed among the world’s most beautiful. Known for its sustainability, NTU

has achieved 100% Green Mark Platinum certification for all its eligible building projects. Apart from its main campus, NTU also has a medical campus in Novena, Singapore's healthcare district.

For more information, visit www.ntu.edu.sg