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Eyeing more durable dental implants with launch of \$66m industry research lab at NTU

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Patients getting dental implants here could soon enjoy shorter recovery times and a reduced risk of infections thanks to advanced coatings being developed here.

These carbon-based nanocomposite coatings – referring to a mixture of different materials with dimensions in the range of nanometres, a thousand times smaller than a human hair – will make implants more durable and improve tissue integration.

The coating bonds strongly to the titanium surface of implants, strengthening them, and also allows for the inclusion of materials such as phosphate and magnesium, which promote healing.

This is part of a partnership between Nanyang Technological University (NTU), nanotechnology firm Nanofilm Technologies International (NTI) and the National Dental Centre Singapore (NDCS).

The novel technology has antimicrobial properties, which reduce the risk of losing dental implants due to infection, said Clinical Associate Professor Goh Bee Tin, NDCS chief executive officer.

This could reduce the need to re-

place implants, thus resulting in cost savings for patients, Prof Goh said.

While more studies are needed, the technology could be more widely available within the next five years, she added.

The agreement was signed in conjunction with the official opening of the \$66 million NTI-NTU Corporate Laboratory held on April 20.

The three-storey, 1,800 sq m lab is sited in NTU and equipped with NTI Nanofilm's industrial-scale coating systems. It brings together more than 60 researchers and PhD candidates working to validate and scale nanotechnology solutions for real-world industry use.

NTI Nanofilm is a Singapore-based global nanotechnology solutions company founded in 1999.

The new lab focuses on four areas – semiconductors, healthcare, renewable energy and nano-fabrication – which NTI executive chairman Shi Xu described as the “highest-growth, highest-impact industries of our time”.

As part of its renewable energy efforts, the lab is also working to develop cheaper and more durable components for hydrogen electrolyzers and fuel cells.

NTU vice-president for industry Lam Khin Yong noted that nano-



Minister-in-charge of Energy and Science and Technology Tan See Leng looking at models of tooth implants at the National Dental Centre Singapore during the opening of the NTI-NTU Corporate Laboratory on April 20.
ST PHOTO: JASEL POH

coatings are among the most commercially successful applications of nanotechnology, with global demand for high-performance coatings projected to exceed \$20 billion by 2030.

The lab has made “meaningful and significant progress”, with seven technology disclosure applications filed within a span of two years, said Prof Lam.

These applications are internal reports submitted to NTU and NTI for evaluation of commercialisation potential. This is the first step in getting intellectual property protection.

Founded as a research programme in 2023, the NTI-NTU Corporate Laboratory is now fully operational, with industrial systems and advanced research platforms, Minister-in-charge of Ener-

gy and Science and Technology Tan See Leng said at the event.

The lab will help strengthen the Republic's position in high-growth segments and create more opportunities for Singaporeans, he said.

“Such partnerships must continue – to ensure that research breakthroughs translate into market-ready solutions that generate economic value,” said Dr Tan, who is also Manpower Minister.

Separately, April 20 also saw the launch of two centres on the NTU campus in collaboration with the Max Planck Society, which is one of Germany's foremost research institutions, named for the famed theoretical physicist.

The Max Planck-Singapore Centre for Data Driven Chemistry is a joint research initiative between NTU, National University of Singa-

pore, A*STAR and two Max Planck institutes for dynamics of complex technical systems and for colloids and interfaces.

The centre aims to digitalise chemical research data as well as build AI tools to help scientists design better materials and optimise chemical processes more quickly and accurately.

This could refine the complex processes inside batteries to produce batteries that are safer, faster-charging and longer-lasting.

The second centre, the Max Planck-NTU Singapore Centre for Biocultural Worlding, housed at NTU's College of Humanities, Arts and Social Sciences, is a collaboration between the NTU Centre for Contemporary Art Singapore and the Max Planck Institute for the History of Science.

The multidisciplinary centre will study the connections between biology and culture, as well as how biodiversity, ecosystems and cultural practices shape each other.

“The vibrant, collaborative ecosystems of both centres will nurture the next generation of scientists, thinkers and artists,” said NTU president Ho Teck Hua.

Max Planck Society president Patrick Cramer described Singapore as one of the society's most important partners in Asia, noting that Max Planck researchers published more than 800 papers with partners here between 2020 and 2024.

“The new centres bring together international talent and complementary strengths – and create the conditions for discoveries that no institution could achieve on its own,” said Prof Cramer.

The two centres are designed as platforms for scientific breakthrough and talent development, said National Research Foundation chairman Heng Swee Keat, who attended the launch.

“They create pathways for young scientists to train in world-class environments, to work across disciplines, and to build international networks early in their careers,” he said.

Mr Heng added: “While Singapore continues to invest significantly in research and development, what we invest in is a small fraction of what the whole world invests in. Partnership like this, with the Max Planck Society and the German government, will enable us to tackle common and complex challenges together.”

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