

ScienceFaces

Singapore cell therapy expert appointed to WHO expert panel

Mickey Koh, who holds posts in Britain and Spore, is on biological standardisation panel

Clara Chong

A Singaporean doctor who is one of the top cell therapy experts in the world has been appointed to a World Health Organisation (WHO) expert panel.

Dr Mickey Koh is so sought after in his field that for the past 15 years, he has been holding two jobs in two different countries.

The 56-year-old shuttles between Britain and Singapore, spending six weeks at a time in London, where he oversees the haematology department and looks after bone marrow transplant patients at St George's University Hospital, before returning to Singapore for a week and a half to head the cell therapy programme at the Health Sciences Authority (HSA).

Cell therapy is a growing field of medicine that uses living cells as treatment for a variety of diseases and conditions. This is an increasingly important therapeutic area and both his employers have agreed to his unusual schedule.

Over in London, Dr Koh is head of the haematology department at St George's Hospital and Medical School. In Singapore, he is the programme and medical director of the cell and gene therapy facility at the HSA.

In May, Dr Koh was selected to be on the WHO Expert Advisory Panel on Biological Standardisation. Individuals have to be invited by WHO to apply, and are well recognised in their respective scientific fields. Eminent names on the panel include the current president of the Paul Ehrlich Institute in Germany, which is the country's federal agency, medical regulatory body and research institution for vaccines and biomedicine.

The WHO panel, which is made up of about 25 members, provides detailed recommendations and guidelines for the manufacturing, licensing and standardisation of biological products, which include blood, monoclonal antibodies, vaccines and, increasingly, cell-based therapeutics.

The recommendations and advice are passed on to the executive board of the World Health Assembly, which is the decision-making body of WHO.

Dr Koh's role had to be endorsed by the British government and was a direct appointment by the director-general of WHO. His appointment as a panel expert will last for a term of four years.

Speaking to *The Straits Times*, Dr Koh shared his thoughts about the importance of regulation: "We are well aware that there is a very lucrative worldwide market peddling unproven stem cell treatments, where side effects are often unknown, and such unregulated practice can result in serious harm."

"This is already happening. People are claiming that you can use stem cells to treat things like ageing, and even very serious conditions like strokes, without any evidence."

With many medications now taking the form of biologics – a drug product derived from biological sources such as cells – the next wave of treatment would be the utilisation of these cells for the treatment of a wide range of diseases, Dr Koh said.

Some examples include the use of immune cells to target cancers and infectious diseases, as well as harnessing the regenerative



Dr Mickey Koh is head of the cell therapy programme at the Health Sciences Authority.
PHOTO: COURTESY OF MICKEY KOH

power of stem cells.

Citing an example of chimeric antigen receptor (CAR) T-cells, which are genetically modified T cells, a type of white blood cells, Dr Koh said: "This form of cell therapy has been shown to be far superior in treating blood cancers (acute leukaemia) compared with chemotherapy and radiotherapy, and has even managed to rescue patients who failed (to respond to) a bone marrow transplant."

"In such patients, who suffer a relapse of acute leukaemia and have received and failed (to respond to) every single conventional treatment, a single infusion of these CAR T-cells can result in their cancers going into remission more than 70 per cent of the time."

Dr Koh is also the vice-president of a non-profit international organisation known as the Worldwide Network for Blood and Marrow Transplantation (WBMT). This unique umbrella organisation comprises many international societies focused on bone marrow transplant and cell therapy.

Dr Koh has led teams on behalf of WBMT to advise governments in setting up bone marrow transplant programmes.

Despite all the travelling, he said he is fortunate that he does not suffer much from jet lag.

"Perhaps it's the coffee, perhaps I am just a usually hyperactive person who doesn't need too much sleep. Perhaps, the many years working unusual hours as a junior doctor prepared me well," said the movie buff.

The past two years of pandemic lockdowns and travel restrictions were very challenging for frequent fliers like Dr Koh.

He was unable to travel back to Singapore for most of 2020 and had to quickly adapt to working virtually. This meant remote lab meetings, e-mail exchanges and adjusting his schedule in London so that it matched the working hours in Singapore.

"That essentially meant I was working some 16 hours a day on my work in the UK, Singapore and internationally. I am extremely fortunate to have nurtured an excellent A-list team comprising consultants, lab directors, scientists and quality managers who were all able to continue my work in Singapore as usual with remote supervision from me," Dr Koh said.

He said he will continue in his roles: "In many ways, this unusual working arrangement has made me understand the complexities of different healthcare systems in different countries, and the pros and cons of each."

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Left: Associate Professor Darren Yeo, the new head of the Lee Kong Chian Natural History Museum, with three fossilised Diplodocid Sauripod skeletons (assumed to be a family) which are estimated to be 148 million to 156 million years old.

Below (clockwise from right): The carcass of a 10.6m female Sperm Whale (Physeter macrocephalus) was found floating off Jurong Island in 2015 and was the first record of this species in Singapore; a taxidermed specimen of a grouper (Epinephelus sp.) in the Marine Cycle zone; a visitor looking at a specimen of a black-eyed litter frog in the gallery; and the Amphibian and Reptile Zone with a taxidermed saltwater crocodile named Kaiser on the right.
ST PHOTOS: CHONG JUN LIANG

ScienceFaces

Telling stories behind specimens in natural history museum

Sabrina Manoharan

Singapore's only natural history museum may be home to more than a million dead animals and ancient artefacts, but its new chief wants to make the place come alive for locals.

How? By highlighting the stories – and secrets – behind the specimens, some of which date back over two centuries, through virtual tours, augmented reality technology and outreach programmes with schools.

"When people think of a museum of natural history, they usually just imagine dead specimens," said National University of Singapore (NUS) Associate Professor Darren Yeo, 50, who took over the reins of the Lee Kong Chian Natural History Museum this month.

"But natural history is the history of life. These specimens hold so many stories to be discovered and appreciated," added the freshwater ecologist.

He pointed to the African sharp-toothed catfish (*Clarias gariepinus*), a species commonly seen in canals, ponds and reservoirs in Singapore.

"But the fish is not naturally found here and was likely to have been introduced via the pet or live food trade," said Prof Yeo.

Today, it seems to have edged out the related but smaller and native common walking catfish (*Clarias batrachus*) in artificial urban freshwater habitats throughout the island.

Prof Yeo said African sharp-toothed catfish specimens are preserved in the museum and may be exhibited in the galleries in the future.

Other specimens from Singapore could yield information about the country's past.

However, as the fishing cat looks

similar to the leopard cat – a species native to Singapore – Mr Chua did an analysis of the specimens in the Dutch museum and compared that with other leopard cat and fishing cat specimens in both museums.

"The conclusion was that the (Dutch) specimen is a fishing cat and not a leopard cat," said Mr Chua.

The research team then dug through old records to piece together a picture of how the specimen fell into the hands of Pierre-Médard Diard, a French naturalist listed as the source of the specimen.

"One possibility is that international trade in large wild animals already took place at that time, and this fishing cat may have been traded in Singapore," he added.

Research associate Martyn Low, who was also involved in the study, said the specimen provided researchers with the earliest Singapore-specific example of the animal trade from early 19th century.

Mr Low said such studies allow an accurate baseline of Singapore's

biodiversity to be established. Such an inventory of species in Singapore can help scientists understand environmental changes such as pollution and extinctions over time, as well as determine conservation priorities.

Prof Yeo, who first joined the museum in 2001 as a research officer and then in 2019 as its deputy head, said that going forward, the museum hopes to highlight such stories behind the specimens by expanding its existing repertoire of outreach tools.

For instance, last year, the museum launched LKCNHM AR – a mobile app which uses augmented reality technology to provide an immersive experience for visitors to view specific exhibits like sauripod dinosaur fossils "in the flesh" and interact with them.

Prof Yeo said the seven-storey museum, located within the NUS Kent Ridge campus, could be a place to spark that interest in the wilderness of South-east Asia, a region with a rich bounty of rainforests, wetlands and seas, home to many creatures found nowhere else in the world.

"Because of where we are located, I think perhaps we're not as well known, easily accessible or immediately appearing on people's radar when they don't know where to go," said Prof Yeo.

He also plans to boost the museum's biodiversity education programmes, including guided tours and workshops, that target students and members of the public – hoping to make learning about the region's biodiversity more relatable.

Prof Yeo said he would also like to see the museum grow further – not only in terms of its research and outreach efforts, but also in physical size.

"With the limited surrounding space, the museum hopes to go vertical by adding more floors next to the museum's iconic rock-shaped building," he added.

Professor Peter Ng, the former and founding head of the museum, said: "I hope the museum continues to serve its mission of not only being the regional centre for biodiversity research and resources, but also expanding our knowledge of South-east Asia's rich biodiversity."

HISTORY OF LIFE
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