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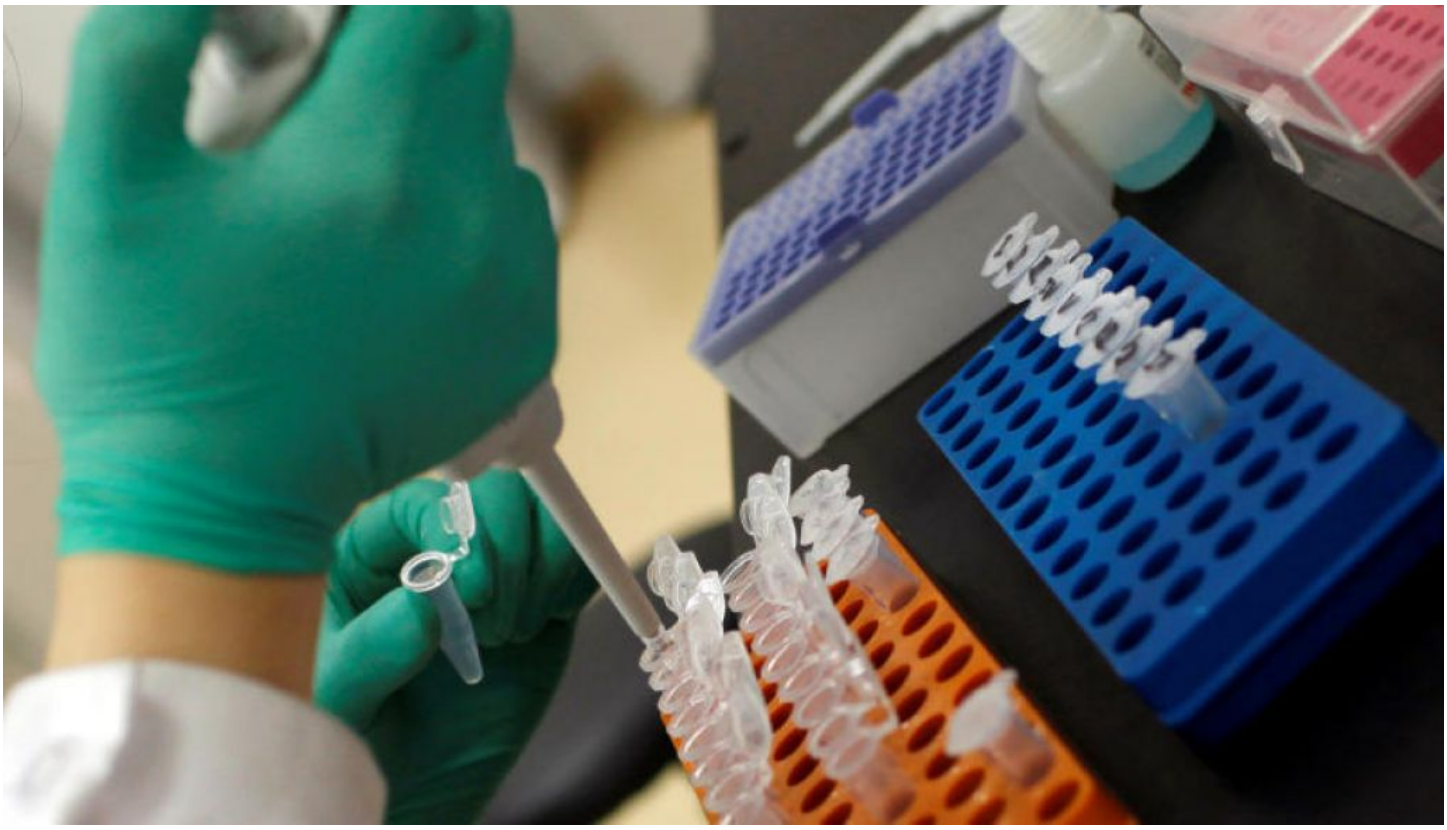

Reuters file photo

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SINGAPORE — Coming on the heels of the launch of a national strategy to deal with drug-resistant bacteria, a new five-year research programme has been launched to tackle the global problem of antimicrobial resistance.

The Campus for Research Excellence and Technological Enterprise (Create), which held a symposium on Friday (Dec 1) to mark its 10th anniversary, announced this and two other initiatives under its wing. The institute, set up by the National Research Foundation and located within the grounds of the National University of Singapore (NUS), houses research centres set up by Singapore and foreign universities.


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new antibodies to combat drug resistant bacteria, viruses and parasites, creating effective tools to diagnose antimicrobial resistance; and engineering viruses that are able to kill drug-resistant bacteria.

Antimicrobial resistance occurs when disease-causing microbes such as bacteria, viruses or parasites grow resistant to the effects of medicine that used to be able to kill them. About 35 to 50 per cent of bacterial infections in Singapore hospitals are now resistant to antibiotics.

Last month, Singapore launched its national strategic action plan to tackle the problem. The team of scientists from Create, who are from Singapore and the Massachusetts Institute of Technology (MIT) in the United States, will make up the research arm of the national taskforce.

Professor Peter Dedon from MIT, who co-leads the programme with Professor Peter Preiser from Nanyang Technological University (NTU), noted that research on antimicrobial resistance has mostly been focused on Western countries.

The research programme they are leading will allow them to look at how it affects the Asian population, with Singapore having the “unique geographical aspect” of being made up of several different ethnic groups.


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and emerging drug resistant organisms," Prof Dedon added.

FINDING WAYS TO GROW BETTER 'CROPS'

Another new initiative launched by Create seeks to improve agricultural processes and produce here, as land-scarce Singapore moves towards high-density urban farming.

The Disruptive and Sustainable Technologies for Agricultural Precision programme, formed by the Singapore-MIT Alliance for Research and Technology, will develop two new technologies to tackle the challenge of food and nutrient production in Singapore's urbanised environment. The project also starts next month.

One experiment will involve placing nano-sensors in the leaves of green vegetables to monitor plant molecules. This will help to find out the optimal environment for vegetables to grow, such as how much sunlight and water they should receive.

The researchers — who are from MIT, the Temasek Life Sciences Laboratory, NUS and NTU — will share the knowledge they glean with Singapore farmers.

Dr Azlinda Anwar, assistant director of the Temasek Life Sciences Laboratory's research and enterprise development division, said that this would help develop healthier and new varieties of plants, and increase farming productivity.

"When you do farming, you want to have leaves of a certain size. But if you try to plant them in (a) high-density (space), you will have certain trade-offs — the plants might have smaller leaves, or grow tall and thin because they need sunlight," she explained.

The researchers will also work on developing larger optic sensors, which can be placed at strategic locations around the plants. Farmers can use these sensors to remotely monitor plant growth.

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CYBER-SECURITY SOLUTIONS, NEW GOVERNING BODY

A third new initiative at Create, which began in September and will run for an initial period of five years, will address issues in cyber-physical systems.

These systems integrate computating, networking, and physical processes, which involve machines and sensors connected through networks for monitoring and controlling engineering devices or systems, for example, in the physical world.

Right now, cyber-security solutions for these systems cannot ensure that the components within the systems behave as designed, the centre said.

The research team will work to make these systems more reliable and secure. The programme will also build up a group of highly trained researchers who specialise in safeguarding the security of these systems.

At the symposium on Friday, it was also announced that a new governing council for Create has been formed. This is to oversee the choice of research programmes and steer outcomes relevant for Singapore. Chaired by former head of the civil service Peter Ho, who is now chairman of the Urban Redevelopment Authority, it will comprise presidents from overseas and Singapore universities that partner Create, and members from government and academia.

Speaking at the symposium, Finance Minister Heng Swee Keat, who also serves as deputy chairman of the National Research Foundation, said: “To properly address complex and messy real-world problems, we need to take an inter-disciplinary approach... (this approach) cuts across traditional academic divisions, and brings together diverse knowledge fields and perspectives.”

In total, Create has produced around 540 patent applications, 336 invention disclosures and 15 spin-off companies. About 1,100 researchers from more than 40 countries are now collaborating on projects with the institute.