Next big COVID treatment may be manufactured antibodies

Reuters

As the world awaits a COVID-19 vaccine, the next big advance in battling the pandemic could come from a class of biotech therapies widely used against cancer and other disorders - antibodies designed specifically to attack this new virus.

Development of monoclonal antibodies to target the virus has been endorsed by leading scientists. Anthony Fauci, the top US infectious diseases expert, called them "almost a sure bet" against COVID-19.

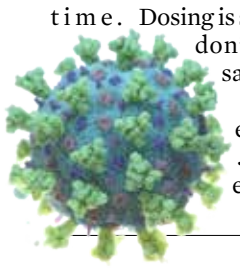
When a virus gets past the body's initial defenses, a more specific response kicks in, triggering production of cells that target the invader. These include antibodies that recognize and lock onto a virus, preventing the infection from spreading.

Monoclonal antibodies - grown in bioreactor vats - are copies of these naturally-occurring proteins.

Scientists are still working out the exact role of neutralizing antibodies in recovery from COVID-19, but drugmakers are confident that the right antibodies or a combination can alter the course of the disease that has claimed more than 675,000 lives globally.

"Antibodies can block infectivity. That is a fact," Regeneron Pharmaceuticals executive Christos Kyratsous told Reuters.

Regeneron is testing a two-antibody cocktail, which it believes limits the ability of the virus' to escape better than one, with data on its efficacy expected by late summer or early fall. "Protection will wane over time. Dosing is something we don't know yet," said Kyratsous.



The US government in June awarded Regeneron a $450 million supply contract. The company said it can immediately begin production at its US plant if regulators approve the treatment.

Eli Lilly and Co , AstraZeneca, Amgen, and GlaxoSmithKline were cleared by the US government to pool manufacturing resources in order to scale up supplies if any of these drugs prove successful.

Even with that unusual cooperation among rivals, manufacturing these medicines is complex and capacity is limited. There is also a debate over whether a single antibody will be powerful enough to stop COVID-19.

AstraZeneca said it plans to start human trials of its dual-antibody combination within weeks. Lilly, which began human testing in June of two antibody candidates in separate trials, is focusing on a one-drug approach.

"If you need a higher dosage or more antibodies, fewer people can be treated," Lilly Chief Scientific Officer Dan Skovronsky said.

Pipettes and sample vials are sen inside a laboratory at Sorrento Therapeutics where efforts are underway to develop an antibody, STI-499, to help in

YOU KNOW WHAT

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'Instant Immunity'

Unlike vaccines, which activate the body's own immune system, the impact of infused antibodies eventually dissipates.

Still, drugmakers say monoclonal antibodies could temporarily prevent infection in at-risk people such as medical workers and the elderly. They could also be used as a therapeutic bridge until vaccines become widely available.

"In a prophylactic setting we think we may achieve coverage for up to six months," said Phil Pang, chief medical officer of Vir Biotechnology, which aims to start testing an antibody in non-hospitalized patients next month with partner GSK.

Safety risks for monoclonal antibodies are considered low, but their cost can be quite high. These type of drugs for cancer can cost over $100,000 a year.

There is also concern that the coronavirus could become resistant to specific antibodies. Researchers are already at work on second-generation compounds with targets other than the crown-like spikes the virus uses to invade cells.

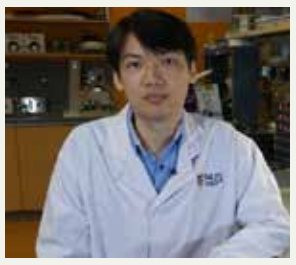
"We are trying to develop something that is complementary," Amgen research chief David Reese said. Amgen is working with Adaptive Biotechnologies Corp.

Researchers in a recent paper published in the journal Nature said they had discovered several new, very potent, antibodies directed to an area where the virus attaches to human cells and to a region of the spike that has not attracted attention.

"To avoid development of resistance you want to target different sites," study author and Columbia University professor David Ho told Reuters.

"Giving an antibody later on after infection might not be that helpful, said Florian Krammer, microbiology professor at New York's Icahn School of Medicine. "Given early, they probably work well."

Scientists inspired by 'Star Wars' create artificial skin able to feel



Dr Benjamin Tee, Assistant Professor of Materials Science and Engineering at the National University, demonstrates how this device can detect the texture of a squishy stress ball at a lat in NUS, Singapore

Reuters | Singapore

Singapore researchers have developed "electronic skin" capable of recreating a sense of touch, an innovation they hope will allow people with prosthetic limbs to detect objects, as well as feel texture, or even temperature and pain.

The device, dubbed ACES, or Asynchronous Coded Electronic Skin, is made up of 100 small sensors and is about 1 sq cm (0.16 square inch) in size.

The researchers at the National University of Singapore say it can process information faster than the human nervous system, is able to recognise 20 to 30 different textures and can read Braille letters with more than 90% accuracy.

"So humans need to slide to feel texture, but in this case the skin, with just a single touch, is able to detect textures of different roughness," said research team leader Benjamin Tee, adding that AI algorithms let the device learn quickly.

A demonstration showed the device could detect that a squishy stress ball was soft, and determine that a solid plastic ball was hard.

"When you lose your sense of touch, you essentially become numb... and prosthetic users face that problem," said Tee.

"So by recreating an artificial version of the skin, for their prosthetic devices, they can hold a hand and feel the warmth and feel that it is soft, how hard are they holding the hand," said Tee.

Tee said the concept was inspired by a scene from the "Star Wars" movie trilogy in which the character Luke Skywalker loses his right hand and it is replaced by a robotic one, seemingly able to experience touch sensations again.

The technology is still in the experimental stage, but there had been "tremendous interest", especially from the medical community, Tee added.

Similar patents developed by his team include a transparent skin that can repair itself when torn and a light-emitting material for wearable electronic devices, Tee said.

Honouring tradition, French artisans harvest salt from the sea

Reuters | Guerande, France

In the salt marshes of northwest France, Franch Durot, a rake in his hand and a hat to keep off the baking sun, is following in a time-honoured tradition, harvesting salt from the sea by hand.

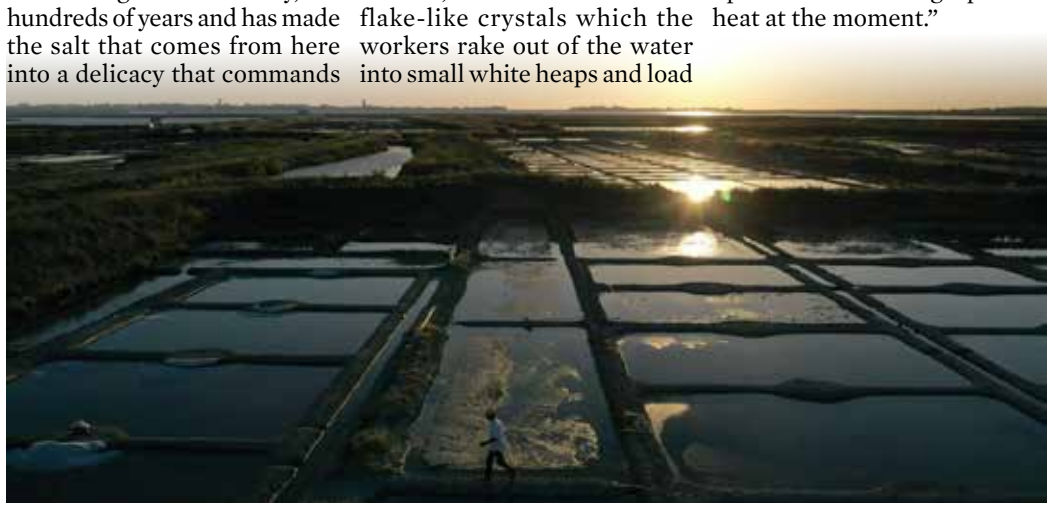
It is a craft that has been practised at Guerande, in the French region of Brittany, for hundreds of years and has made the salt that comes from here into a delicacy that commands high prices around the world.

The low-lying marshes have been criss-crossed with a grid of earth mounds that creates a network of rectangular lagoons. Sea water from the Atlantic is flushed into the lagoons through ditches, then allowed to evaporate.

When the salt in the water reaches the right concentration, it forms into snowflake-like crystals which the workers rake out of the water into small white heaps and load into wheelbarrows. They then move onto the next lagoon and repeat the process.

Durot, who has been doing the job for 23 years, said the high temperatures this month meant more work, as the evaporating water yields more salt.

"This year, in 2020, we're seeing really good productivity," he said on a break from raking up salt. "We're facing a peak of heat at the moment."



A salt farmer harvests salt during sunset in the salt marshes in Batz-sur-Mer, Franc

Lebanese foreign minister quits over lack of reform as crisis spirals

Reuters | Beirut

Lebanese Foreign Minister Nassif Hitti resigned on Monday, blaming a lack of political will to enact reforms to halt a financial meltdown which he warned could turn Lebanon into a failed state.

Foreign donors have made clear there will be no aid until Beirut makes changes to tackle state waste and corruption - roots of the crisis, which poses the biggest threat to Lebanon's stability since a 1975-1990 civil war.

"Given the absence of an effective will to achieve structural, comprehensive reform which our society and the international community have urged us to do, I have decided to resign," Hitti said in a statement.

Prime Minister Hassan Diab accepted the resignation and was making phone calls as he sought a replacement, his office said on Monday.

Lebanon's Foreign Minister Nassif Hitti gestures during a cabinet meeting at the presidential palace in Baabda, Lebanon

A former ambassador to the Arab League, Hitti was appointed in January when Diab's cabinet took office with the support of the Iran-backed Hezbollah movement and its allies.

"I took part in this government to work for one boss called Lebanon, then I found in my country multiple bosses and contradictory interests," Hitti said. "If they do not come together in the interest of rescuing the Lebanese people, God forbid, the ship will sink with everyone on it."

He also had differences with Diab and was frustrated at being sidelined, sources close to the foreign ministry told Reuters. Diab appeared to criticise France's foreign minister for tying aid to reforms and a deal with the International Monetary Fund (IMF) when visiting Beirut last month.