NEWS IN FOCUS

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In China, samples of human DNA cannot be shared between companies or institutions without permission from the government.

POLICY

China cracks down on genetics breaches

Biomedical companies have been punished for sharing DNA data without permission.

BY DAVID CYRANOSKI

China's enormous population is a genetics goldmine. But the government, wary that these data could be exploited for profit, has been cracking down on researchers and companies that violate rules on sharing its citizens' genetic material and information. Some scientists fear that this closer attention is creating hurdles for international collaborations.

Last month, for the first time, the ministry of science named and shamed companies that have broken the sharing regulations that the government introduced in 1998. Five companies and one research hospital were rebuked for transferring human DNA samples or genetic data to other entities in China or outside the country, without permission from the ministry's human genetic resources office. It is not clear why the ministry released details of the breaches now — some as recent as this year, others a few years old.

Global pharmaceutical giant AstraZeneca, which has a research centre in Shanghai, was caught earlier this year transferring samples — used to create diagnostic tests for predisposition to breast cancer — to two smaller Chinese companies, Amoy Diagnostics in Xiamen and Kunhao Ruicheng in Beijing. AstraZeneca was authorized to collect the samples, but the company says it did not know that it needed permission to transfer the material to another party in China.

The regulations require government authorization for anyone who wants to transfer ▶

human DNA samples or share genetic data. Permission is also required to publish these data in international journals.

The ministry says genomics giant BGI in Shenzhen and Shanghai's Huashan Hospital were also caught breaking the regulations, after they put genetic information online without approval. The data were part of a large international study on the genetics of depression, which was published in *Nature* in 2015 (CONVERGE consortium. *Nature* **523**, 588–591; 2015). The paper was based on anonymized sequence data from more than 10,000 Chinese women, which BGI acknowledges it did not have permission to publish in the paper's supplementary material.

A spokesperson for the company says it has destroyed the data, as requested by the ministry. They say the company has also requested *Nature* remove the article from its website. It remains online. A spokesperson for *Nature* would not comment on the matter. (*Nature*'s news team is editorially independent of its journal team.)

Scientists and policy experts are worried that the government crackdown might deter researchers from sharing genetic data collected in China. "At a time when transparency, open access and sharing are high priorities, enforcing the 1998 rules obviously seems to be going in the opposite direction," says Nicholas Steneck, who studies research integrity at the University of Michigan in Ann Arbor.

Many countries control how their citizens' genetic material and data can be collected and shared, mainly to protect people's privacy and ensure that samples are gathered with informed consent. China's rules are also meant to ensure that the country reaps some of the profits from patented discoveries.

But scientists say that complying with the rules is creating obstacles. An international collaboration investigating genetic samples from more than 140,000 pregnant Chinese women had to send a data-analysis expert to China because the data could not leave the country, says group member Anders Albrechtsen, a geneticist at the University of Copenhagen.

"If applying for permission is onerous or time-consuming, this will have a detrimental effect."

The group — which included researchers from BGI — did not try to get approval to publish the anonymized genetic data. Instead, in a paper published in *Cell* in October, it included a disclaimer saying that the authors will provide only summary statistics to other researchers (S. Liu *et al*. *Cell* **175**, 347–359; 2018). The president of BGI Research, Xu Xun, says the team feared that it would have taken too much time and effort to get permission to share the raw sequence data. He also thinks that sharing population-level statistics is sufficient.

Geneticist Paul Flicek of the Wellcome Sanger Institute in Hinxton, UK, thinks it is reasonable for governments to require approval to share genetic information, but that "if the process of applying for permission is onerous or time consuming, this will have a detrimental effect on data sharing".

If China continues to enforce its regulations, genetics research in the country could become isolated from international groups, says Arcadi Navarro, a geneticist at Pompeu Fabra University in Barcelona, Spain.

A spokesperson for *Cell* says that the journal requires that the data behind publications be made available, but its policy acknowledges the need to respect the regulations and guidelines of review boards and national bodies, as well as laws on patient privacy and personal data.

China's science ministry did not respond to *Nature*'s questions about whether its restrictions impede research.

In its announcement, the ministry did say that, as punishment for their breaches, BGI, AstraZeneca and Huashan Hospital had been banned from participating in international collaborations that use human genetic resources until they passed a data-privacy examination. BGI says it passed this in 2017. AstraZeneca says it is working towards its reassessment now. *Nature*'s attempts to contact the hospital were unsuccessful.

Both BGI and AstraZeneca say that they accept the government's penalties and support the country's attempts to protect the genetic resources of its citizens. ■

POLITICS

Scientists win in US midterm elections

Trump administration's controversial science and environment policies could come under extra scrutiny as Democrats gain in Congress.

BY JANE J. LEE, AMY MAXMEN, JEREMY REHM & JEFF TOLLEFSON

The results of the political experiment are in. At least 12 candidates with backgrounds in science, technology, engineering or medicine were elected to the US House of Representatives on 6 November — including several who had never before run for political office.

They include Elaine Luria, a US Navy veteran and nuclear engineer in Virginia, and Chrissy Houlahan, a former business executive with a degree in engineering, in Pennsylvania. Illinois saw wins by registered nurse Lauren Underwood, a former senior adviser to the Department of Health and Human Services, and clean-energy entrepreneur Sean Casten, who has degrees in engineering and biochemistry.

The four — all Democrats — are among roughly 50 candidates with science backgrounds who ran for the House in 2018, sparked in part by opposition to President Donald Trump. Fewer than half of these novice politicians made it past the primaries to the general election, but many science advocates are already looking to the next campaign cycle.

"I'm feeling good," says Representative Bill Foster (Democrat, Illinois), a physicist who has pushed to increase the number of scientists in elected office. Foster, the only current member of Congress with a science PhD, is excited about wins at the state and local levels by candidates with backgrounds in science, technology, engineering or medicine (STEM). "We'll have a much deeper bench among STEM candidates in future races for Congress," he says.

The advocacy group 314 Action, which sprang up after the 2016 election to help scientists run for office, says that 8 of the 22 candidates it endorsed for the House or Senate ultimately won. The group in Washington DC also backed about 50 candidates in state races, and 31 won.

"It's certainly exceeded our expectations of what we would be able to do this year," says Shaughnessy Naughton, 314 Action's