

NEWS AND ANALYSIS

## BGI Shakes Up Sequencing


BGI has entered the American genome sequencing market for the first time, forcing scientific innovation to clash with national security.

BY GARRETT O'BRIEN — AUGUST 14, 2022

Credit: BGI Group via [Twitter](#)

China's most successful genome sequencing company, [BGI Group](#), is set to gain a larger slice of the crucial U.S. market following a recent legal settlement with its closest American rival — amid concerns about data privacy and its links to the Chinese government.

After years of legal wrangling, the agreement inked last month between BGI's U.S. subsidiary and San Diego-based [Illumina](#) has given the Chinese firm the green light to sell a key product, the CoolMPS sequencer, from August this year, and its other models from 2023 onwards. Illumina will also [pay BGI](#) \$325 million for past patent infringements.

The deal gives BGI the opportunity to challenge Illumina's largely untrammelled dominance of the market for sequencers, a cutting-edge product commonly used by research institutions and clinicians in applications such as pre-natal genetic disease testing and cancer screening. Illumina currently has an 80 percent market share globally of next generation sequencers, [according](#)  to the U.K.'s Competition and Market Authority.

But the growing presence of Shenzhen-listed BGI — founded in 1999 by geneticist [Wang Jian](#), who remains its chairman and controlling stakeholder — is not without controversy. Like other successful high-tech and scientific Chinese companies, it has previously [collaborated](#) with the People's Liberation Army, and is still 1.5 percent owned by the Chinese government, according to WireScreen.<sup>1</sup>

In July 2020, two BGI subsidiaries, Xinjiang Silk



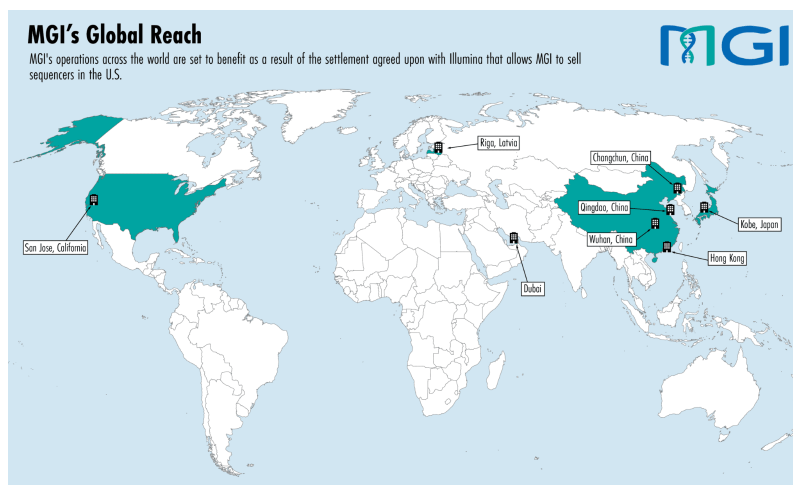
Wang Jian at the Annual Meeting of the New Champions in Tianjin, China. Credit: World Economic Forum via [Flickr](#)

Road BGI and Beijing Liuhe BGI, were [added](#) to the Department of Commerce's Entity List for "conducting genetic analyses used to further the repression of Muslim minority groups." U.S. companies are barred from exporting goods to firms on the U.S. Entity List.

"If it's on the Entity List, it probably shouldn't have that market access," says [Anna Puglisi](#), director of Biotechnology Programs at Georgetown's Center for Security and Emerging Technology (CSET).

For now, BGI is celebrating the settlement with Illumina which includes a provision that will effectively mean the two companies refrain from challenging each other over patent infringements for the next three years.

"With this settlement, we are going to have full access to the U.S. market and we will try to get as much market share as possible, and we will enable new research and discoveries with higher quality and lower cost," says [Yongwei Zhang](#), chief executive of MGI America, BGI's U.S. subsidiary, and a vice president of BGI.



Source: [MGI's website](#)

The Chinese company has had considerable exposure to the U.S. before: At one point, BGI was Illumina's biggest customer, purchasing as many as 128 sequencers from it in 2010. That changed after BGI's \$117 million [purchase](#) of Complete Genomics, a U.S.-based sequencing company in 2013, which made BGI a direct competitor to Illumina.

"It's not as if BGI has been totally absent and then suddenly appeared on the market. This is something that BGI has been working towards for a long time," says [Hallam Stephens](#), a professor specializing in the history of science and technology at James Cook University in Australia.

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[Click here to read Jolly Gene Giant, a cover story about BGI's relationship with Beijing.](#)

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Industry experts expect BGI's settlement with Illumina to have a significant impact on the genome sequencing landscape. The terms of the agreement, in effect, open up patents owned by Illumina, making it easier for sequencing companies around the world to bring products to market. That, in turn, should lead to a fall in prices for sequencers, analysts say.

"Our strategy is unchanged. Illumina remains committed to driving down the cost of sequencing, increasing the capabilities of our platforms to address customer needs, building world-class products and broadening access to genomics — a driving vision for Illumina," an Illumina spokesperson told *The Wire*.

“The entrance of BGI to the market will either cause Illumina to be more innovative, which will be great, or it will cause a lot of flowers to bloom in the industry which will also be great.”

— [George Church](#), a geneticist at Harvard and longtime BGI advisor

“It’s great to have new sequencing hardware companies enter the market — both new American companies and BGI,” says [Joe Pickrell](#), chief executive of [GenCove](#), a genomics software start-up in New York that has previously partnered with BGI. “Different hardware will have different use cases and that’s really going to advance the field,”

Scientists who have worked with BGI have also welcomed the development. “The entrance of BGI to the market will either cause Illumina to be more innovative, which will be great, or it will cause a lot of flowers to bloom in the industry which will also be great,” says [George Church](#), a Harvard geneticist and longtime BGI advisor who testified on behalf of BGI during a patent dispute with Illumina. “Not just in terms of price, but in terms of quality.”

Sensitivities around genetic data, and who has access to it, are a concern for some, however. Under Chinese law, any company that stores data in China is required to hand it over to the government, if requested.

The Office of the Director of National Intelligence declined to comment on the BGI-Illumina settlement, but referred to a [factsheet](#), published in February 2021 by the National Counterintelligence and Security Center, which highlights the risks around the acquisition of U.S. citizens’ DNA data by Chinese entities.

“Compared to other nations, the U.S. has fewer safeguards on medical and healthcare data, including data for research purposes,” the factsheet states. “Over the years, Chinese companies have taken advantage of this environment by investing in U.S. firms that handle sensitive healthcare and other types of personal data, providing them entry to the U.S. market and access to this data,” it adds, citing BGI’s acquisition of Complete Genomics as one example.

For instance, China’s BGI purchased U.S. genomic sequencing firm Complete Genomics in 2013. In 2015, China’s WuXi Pharma Tech acquired U.S. firm NextCODE Health to later form WuXi NextCODE Genomics.<sup>7</sup>

An excerpt from the [NCSC China Genomics factsheet](#)

Both BGI and its subsidiary MGI have rejected claims that they are affiliated with the Chinese government and that Beijing has access to its data. MGI has tried to temper privacy concerns by offering sequencers to customers without a network connection, meaning that any genomic data processed by the sequencer is not transferred to its parent BGI’s online storage facilities.

“Because our products can be run without connecting to the internet, the physical isolation between the internet and our instruments will protect customers from data breach and will enhance reliability, confidentiality, and data integrity,” says MGI’s Zhang. “Without connecting to the internet or outside networks, there is absolutely no risk of data being accessed by people outside the lab.”

“It’s a problem to automatically assume nefarious purpose with Chinese researchers and Chinese companies.”

— *Dr Abigail Coplin, a sociologist at Vassar College*

Others, such as CSET's Puglisi, are worried about bringing Chinese companies like BGI into the supply chain for genome sequencing.

"It's a technical infrastructure issue that was seen with Covid. We don't want an entire section of our R&D activities dependent on a Chinese company," she says.

Within the genomics industry, however, there appear to be few qualms about working with BGI.

"They are quite upfront about the fact that they receive grants from the Chinese government, even loans at various points from the China Development Bank. The Chinese government has invested research money into them," says Stephens, the James Cook University professor. "That's the same that you might expect from many labs globally: Labs take money from various places, including from government sources."

"It's a problem to automatically assume nefarious purpose with Chinese researchers and Chinese companies," says [Abigail Coplin](#), a sociologist at Vassar College who studies the Chinese biotech industry. "Biotechnology is intrinsically a transnational endeavor and has always been."



Garrett O'Brien is a student at Harvard University studying how China interacts with the rest of the world. His research interests include Chinese international development projects and financial regulation. [@GarrettOBrien17](#)

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