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Chinese DNA giant's U.S. affiliate looks to rival Illumina, touting $100 genome and high-power sequencers

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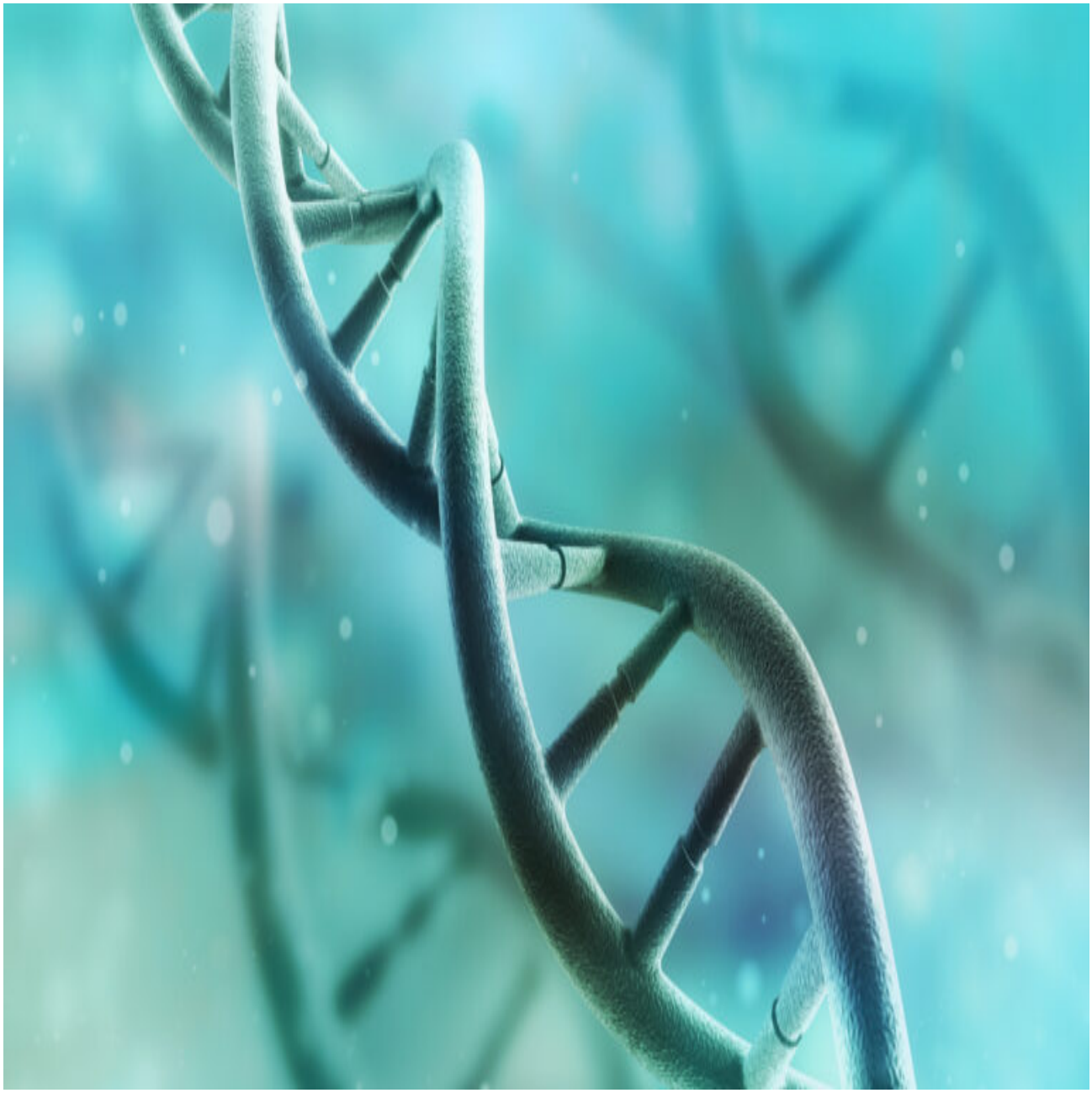

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Complete Genomics, a U.S. firm affiliated with Chinese sequencing giant BGI, on Tuesday announced plans to launch a new line of sequencers it says can decode DNA in larger amounts — and at lower costs — than any instrument on the market.

The company claims the sequencer, dubbed DNBSEQ-T20, can read up to 50,000 human genomes a year, 2.5 times the max output of a line of new high-end sequencers that Illumina, the market leader, recently launched.

And the cost of reading each genome will be as low as $100, which the company's executives boast would be the lowest-ever price point since the figure includes the cost of the materials and chemicals used in sequencing as well as amortization of the machine.

But one detail was conspicuously absent from the announcement, issued at the annual Advances in Genome Biology and Technology meeting in Hollywood, Fla.: the total cost of the sequencer.

That's information companies usually provide. But Complete Genomics CEO Yongwei Zhang declined to share the instrument's price. Instead, he said that customers who run the product at or near capacity would be able to pay off the instrument within a "few years."

Those customers are bound to be companies and labs that need to churn out reams of genetic data. That could include researchers studying the genetics of large populations, or scientists searching for rare microbes and cells. But for users who don't need tons of data, Complete Genomics will offer a lower-end instrument, DNBSEQ-G99, which will be sold starting in the second quarter for $129,000. The firm plans to begin accepting orders for DNBSEQ-T20 in the third quarter.

It's all part of a multipronged effort to gain ground in the U.S. genomics market, which Complete Genomics is reentering after winning a patent dispute with Illumina. A growing chorus of companies — from PacBio to Singular to Element and Ultima — is looking to chip away at Illumina's hold on about 80% of the global genomics market. Unlike these companies, Complete Genomics already has a range of products, from low- to high-end machines, that compete with Illumina instruments.

"This is currently the lowest publicly announced price that I'm aware of, so it's evidence of prices being pushed down even lower," said Shawn

Baker, a sequencing consultant with more than 20 years of genomics experience. “It’s another example of competition really heating up.”

Complete Genomics, headquartered in the Bay Area, was founded in 2006 before going public in 2010 for around $47 million. It was then acquired by Chinese genomics company BGI for $117 million in 2013 and is now a subsidiary of MGI, an offshoot of BGI focused on developing and deploying new DNA sequencers.

The company’s sequencing technology, like that of Illumina, reads small bits of DNA and then stitches them together, an approach known as short-read sequencing. But Complete Genomics uses a different series of chemical reactions to get there. Its approach takes pieces of DNA and first turns them into loops. An enzyme then zips around each loop, producing copies of the original DNA that string together.

The result, known as a DNA nanoball, looks a bit like a tumbleweed, and it’s these nanoballs that the company sequences. It’s a strategy Chief Scientific Officer Rade Drmanac said is especially reliable, because each nanoball contains direct copies of the original sequence.

Complete Genomics’ sales in the U.S. have been hampered by a long-running legal feud. In 2019, San Diego-based Illumina sued BGI, claiming its sequencing technology infringed on Illumina patents. And in March 2020, a federal judge granted a preliminary injunction against BGI, blocking the sale of BGI Group products in the U.S.

That all changed last May, when a Delaware jury ordered Illumina to pay more than $333 million in damages after finding that the company had infringed on two Complete Genomics patents. Both companies have agreed not to bring any patent or antitrust cases against each other in the

United States for three years, setting the stage for Complete Genomics to return to the U.S. market.

The company has been selling products in the U.S. since August. But with legal troubles out of the way, it now faces a new challenge — reassuring potential customers that their data will be secure in the face of recent reports about BGI Group. A 2021 investigation by Reuters found that BGI was collecting genetic information using prenatal tests developed in collaboration with China's military. And in October, the Defense Department added BGI Genomics — another subsidiary of BGI Group — to a list of companies blacklisted from U.S. investment.

BGI has strongly denied the claims in the Reuters report. And in a conversation with STAT, Zhang pointed out that the sequencers sold by Complete Genomics can be operated without any connection to the internet, eliminating any possibility of data tampering.

"Everything can be contained," he said. "Customers have complete control of their samples and other data. So there's absolutely no chance for any unauthorized users from outside labs to access data."

Another instrument being released by the sequencing firm, DNBSEQ-G99, is targeted at users who don't need to produce tons of data but need answers fast. The machine can spit out data in less than 12 hours, compared to three or four days for the high-end instruments. Such speedy sequencing can be especially useful in diagnosing seriously ill patients and determining the best course of treatment.

The company is also dropping prices on an existing sequencer, DNBSEQ-T7, which can read 20,000 genomes a year. It'll now cost $150 to decode a genome on the instrument, which was launched in the U.S. in January.

The cost of DNA sequencing has dropped dramatically over the years. Reading a single genome cost around $10 million in 2006, $100,000 in 2009, and then $1,000 in 2017, according to the National Human Genome Research Institute. And while cost alone is far from the only hurdle to using genomics to improve human health, Drmanac believes it is an important one.

“I personally believe that, in a decade, the world will be sequencing 1,000 times more [DNA] bases than today,” he said. “That’s what we’re driving. We’re really trying to enable scientists to understand the genome and ourselves at [an] affordable price.”

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