Twist Bioscience Expands Agreement to Pursue Higher Density Digital Data Storage on DNA with Microsoft and University of Washington

April 18, 2017

SAN FRANCISCO, Calif. – April 17, 2017 – Twist Bioscience, a company accelerating science and innovation through rapid, high-quality DNA synthesis, today announced Microsoft Corp. will purchase ten million strands of DNA from Twist Bioscience for expanded digital data storage research. The strands of DNA will be long-chain oligonucleotides used by researchers at Microsoft and the University of Washington to encode digital data at higher density. After working together for over a year, the organizations have improved storage density, thereby reducing the cost of DNA digital data storage by encoding more data per strand and increasing the throughput of DNA production.

In April 2016, Twist Bioscience announced an agreement with Microsoft to explore the storage of digital data on DNA through an initial purchase agreement of ten million strands of synthetic DNA. In July 2016, researchers at Microsoft and the University of Washington reached an early, but important milestone, by storing a record 200 megabytes of data on DNA. With the early success in both encoding and decoding the data with 100 percent accuracy, the companies are now expanding their agreement to continue to increase the density of digital data storage on DNA to reduce costs.

"Importantly, not only does DNA provide a high density, very long-term solution to digital data storage, it requires very little energy at rest compared to today's storage technologies," commented Luis Ceze, Ph.D., the University of Washington's Torode Family Career Development Professor of computer science and engineering, and also one of the project's lead researchers. In addition, DNA will never become obsolete as an information storage medium, since we will always care about reading DNA. No more migration from disk to tape to denser tape."

"We are delighted to see the positive response and growing excitement over DNA as a solution to our world's growing digital storage dilemma," commented Emily M. Leproust, Ph.D., CEO of Twist Bioscience. "We have taken up the challenge of massively increasing DNA synthesis scale to accelerate adoption of DNA as the logical replacement for current legacy electronic and magnetic storage technologies. We are thrilled to continue our work with Microsoft and the University of Washington researchers to drive this technology forward."

"There are still many challenges in making DNA storage mainstream, though we are encouraged by the work we have completed to date," said Karin Strauss, Ph.D., a Senior Researcher at Microsoft, and one of the project's lead researchers. "Demand for data storage has been growing at break-neck pace. Organizations and consumers who need to store a lot of data – for example, medical data or personal video footage – will benefit from a new long term storage solution. We believe DNA may provide that answer."

Using DNA for Digital Data Storage

The quantity of digital data continues to outpace our ability to store it, approximately doubling every two years. There is a drastic need for a new storage medium that effectively and securely stores data. The recent convergence of affordable DNA sequencing and the scalability of Twist Bioscience's silicon-based DNA synthesis technique presents a new opportunity enabling the DNA to become a viable data storage option. Using DNA as an archival technology avoids two key limitations of traditional digital storage media: limited lifespan and low data density. DNA data storage could last up to 2,000 years without deterioration, according to a recent presentation at the American Chemical Society. In addition, a recent study by Columbia University and New York Genome Center, using Twist Bioscience DNA, showed a few grams of DNA can store an exabyte of digital data. With higher density storage, it may be possible to store one trillion gigabytes (a zettabyte) of digital data with just a few grams of DNA.

About Twist Bioscience

At Twist Bioscience, our expertise is accelerating science and innovation by leveraging the power of scale. We have developed a proprietary semiconductor-based synthetic DNA manufacturing process featuring a high throughput silicon platform capable of producing synthetic biology tools, including genes, oligonucleotide pools and variant libraries. By synthesizing DNA on silicon instead of on traditional 96-well plastic plates, our platform overcomes the current inefficiencies of synthetic DNA production, and enables cost-effective, rapid, high-quality and high throughput synthetic gene production, which in turn, expedites the design, build, test cycle to enable personalized medicines, pharmaceuticals, sustainable chemical production, improved agriculture production, diagnostics and biodetection. We are also developing new technologies to address large scale data storage. For more information, please visit www.twistbioscience.com. Twist Bioscience is on Twitter. Sign up to follow our Twitter feed @TwistBioscience at https://twitter.com/TwistBioscience.

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