Twist Bioscience and Eleven Therapeutics Create Replicon for Development of Antiviral Tools

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SOUTH SAN FRANCISCO, Calif. & CAMBRIDGE, England--(BUSINESS WIRE)--Feb. 7, 2022-- Twist Bioscience Corporation (NASDAQ: TWST), a company enabling customers to succeed through its offering of high-quality synthetic DNA using its silicon platform, and Eleven Therapeutics, a company leading the AI revolution in nucleic acid therapies, today announced that they have created a replicon tool that could be used for studying viral genome replication and antiviral drug screening as well as vaccine and therapeutic development.

Replicons are synthetic viral RNA molecules that mimic viruses in their ability to replicate but have been engineered to remove the portion of the genome that causes harm (infectiousness). Replicon systems have been successfully used to mimic RNA viruses including Zika, Dengue, and SARS-CoV-1 to facilitate safe and rapid development of novel therapeutics.

Through a publication on bioRxiv, the teams demonstrated the development of a safe and efficient SARS-CoV-2 replicon-generating engine, empowered by massively parallel DNA synthesis. By engineering the replicon, the teams retained 97% of the viral genome but completely eliminated any infectivity properties of SARS-CoV-2. Researchers can use this replicon to study viral activity without the need for patient samples or risk of handling live virus.

“We demonstrated that a viral replicon for SARS-CoV-2 could be an effective and safe way to study the virus using the Beta (B.1.351) variant but given the inherent flexibility of the replicon system, we can readily produce other variants, such as Delta (B.1.617.2) or Omicron (B.1.1.529),” said Yaniv Erlich, CEO of Eleven Therapeutics. “We developed this in only three weeks, showing that both the active ingredient in the commercial antiviral drug molnupiravir and our proprietary RNAi treatment, which had already been known to effectively treat other variants of the SARS-CoV-2 in live virus samples, inhibited the replicon effectively, confirming therapeutic development applicability for the replicon.”

“Replicons offer a safe alternative to study viruses and represent another potentially important tool in fighting SARS-CoV-2,” commented Emily M. Leproust, Ph.D., CEO and co-founder of Twist Bioscience. “Using the framework we developed, researchers can quickly establish new assays to develop specific therapeutics and study variant characteristics. Utilizing automatic monitoring systems for emerging SARS-CoV-2 variants, synthetic biology can complement these efforts by enabling rapid prototyping of therapies or vaccine interventions for future variants of concern.”

Twist Bioscience has formed an institutional biosafety committee to review and monitor research and development as well as commercial activities that involve pathogens, biological toxins or other biohazardous materials.

About Eleven Therapeutics

Eleven Therapeutics ushers in the next generation of RNAi therapeutics by combining artificial intelligence (AI), massively parallel functional assays, and combinatorial chemistry. Its flagship invention features a new modality, dubbed SCSI-RNA™ (single-chassis, small interfering RNA), a fully programmable molecule, rationally designed to address the delivery, durability, and efficacy challenges of any disease and biological target of interest. Founded in 2020 by a group of globally-leading, interdisciplinary scientists, Eleven Therapeutics brings new RNAi therapeutics for patients in need by capitalizing on some of the world’s best pools of talent through its three collaborative hubs—in Cambridge, UK; Boston, U.S.; and Tel Aviv, Israel. Eleven is currently focusing its development pipeline on siRNA treatments for a range of respiratory diseases. To learn more, visit www.eleventx.com.

About Twist Bioscience Corporation

Twist Bioscience is a leading and rapidly growing synthetic biology and genomics company that has developed a disruptive DNA synthesis platform to industrialize the engineering of biology. The core of the platform is a proprietary technology that pioneers a new method of manufacturing synthetic DNA by “writing” DNA on a silicon chip. Twist is leveraging its unique technology to manufacture a broad range of synthetic DNA-based products, including synthetic genes, tools for next-generation sequencing (NGS) preparation, and antibody libraries for drug discovery and development. Twist is also pursuing longer-term opportunities in digital data storage in DNA and biologics drug discovery. Twist makes products for use across many industries including healthcare, industrial chemicals, agriculture and academic research.

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