Generation Bio Provides Update on Preclinical Studies for Hemophilia A Program

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- *Innovations in closed-ended DNA (ceDNA) and cell-targeted lipid nanoparticle (ctLNP) production processes generated peak mean of 205% normal human factor VIII expression in mice*
- *Non-human primates (NHPs) demonstrated up to 2% normal human factor VIII expression, and higher-than-expected variability within and between studies*
- *Company is using insights from preclinical studies to advance additional novel proprietary ctLNPs to improve species translation to meet target profile for a development candidate*

CAMBRIDGE, MASS., Dec. 14, 2021 (GLOBE NEWSWIRE) -- Generation Bio Co. (Nasdaq: GBIO), a biotechnology company innovating genetic medicines for people living with rare and prevalent diseases, today provided an update on factor VIII expression from a series of mouse and companion non-human primate (NHP) studies in hemophilia A, as well as an update on the development of its non-viral genetic medicine platform. Generation Bio's proprietary genetic medicine technology comprises a closed-ended DNA (ceDNA) delivered via a novel, cell-targeted lipid nanoparticle (ctLNP). In July 2021 the company announced that it would incorporate its novel, proprietary rapid enzymatic synthesis (RES) for ceDNA production into its pipeline programs. RES has improved ceDNA purity to 99%.

In mouse studies, RES-derived ceDNA delivered by ctLNP generated peak mean human factor VIII expression of 205% of normal at 2.0 mg/kg. This is compared to peak mean human factor VIII expression of 23% of normal at 2.0 mg/kg using ceDNA produced by the company's prior Sf9-based manufacturing process. In addition to the increased potency attributed to the RES-produced ceDNA and to ctLNP production process innovations, the company observed lower variability of factor VIII expression and of tolerability within and between mouse studies. Findings from companion studies in NHPs demonstrated human factor VIII expression of up to 2% of normal at 2.0 mg/kg, with higher-than-expected variability in both factor VIII expression and tolerability within and across studies. Additional optimization is needed to translate the improvement in potency and reduction in variability observed in mice to NHP, and to support nomination of a development candidate for the company's hemophilia A program.

"Over the course of the year, we have made significant progress in the development of our platform," said Matthew Stanton, Ph.D., chief scientific officer. "We have demonstrated that RES produces highly pure ceDNA across a variety of manufacturing scales and we have developed new production processes that have similarly enabled substantial improvements in the control and consistency of our ctLNPs. We are working to translate the improved potency and decreased variability that we have observed in mice to NHPs. By applying novel analytical methods to these preclinical studies in both species, we have gained important insights that we believe will allow us to advance additional novel proprietary ctLNPs to meet our target profile for a hemophilia A development candidate."

"At Generation Bio, we are innovating genetic medicines intended to exceed the limits of conventional gene therapies and to impact the lives of millions of people," added Geoff McDonough, M.D., chief executive officer. "Since our founding, we have been leading the frontier of systemic DNA delivery to build an entirely new non-viral genetic medicine platform to realize this vision. While we still have work to do, we believe the creativity and rigor of our science will unlock the full potential of genetic medicine. We have a terrific team and strong balance sheet to pursue this work and look forward to further progress in the next year."

The company expects to announce updates from its pipeline programs in 2022 and to provide timing for its first IND submission in the future.

About Generation Bio

Generation Bio is innovating genetic medicines to provide durable, redosable treatments for people living with rare and prevalent diseases. The company's non-viral genetic medicine platform incorporates a novel DNA construct called closed-ended DNA, or ceDNA; a unique cell-targeted lipid nanoparticle delivery system, or ctLNP; and a highly scalable capsid-free manufacturing process that uses proprietary cell-free rapid enzymatic synthesis, or RES, to produce ceDNA. The platform is designed to enable multi-year durability from a single dose, to deliver large genetic payloads, including multiple genes, to specific tissues, and to allow titration and redosing to adjust or extend expression levels in each patient. RES has the potential to expand Generation Bio's manufacturing scale to hundreds of millions of doses to support its mission to extend the reach of genetic medicine to more people, living with more diseases, around the world. For more information, please visit www.generationbio.com.

Forward-Looking Statements

Any statements in this press release about future expectations, plans and prospects for the company, including statements about our strategic plans or objectives, our technology platform, our research and clinical development plans, the expected timing of the submission of investigational new drug, or IND, applications and preclinical data and other statements containing the words "believes," "anticipates," "plans," "expects," and similar expressions, constitute forward-looking statements within the meaning of The Private Securities Litigation Reform Act of 1995. Actual results may differ materially from those indicated by such forward-looking statements as a result of various important factors, including: uncertainties inherent in the identification and development of product candidates, including the conduct of research activities, the initiation and completion of preclinical studies and clinical trials and clinical development of the company's product candidates; uncertainties as to the availability and timing of results from preclinical studies and clinical trials; whether results from preclinical studies will be predictive of the results of later preclinical studies and clinical trials; uncertainties regarding the timing and ability to complete the build-out of the company's manufacturing facility and regarding the new manufacturing process; expectations regarding the timing of submission of IND applications; expectations for regulatory approvals to conduct trials or to market products; challenges in the manufacture of genetic medicine products; whether the company's cash resources are sufficient to fund the company's operating expenses and capital expenditure requirements for the period anticipated; the impact of the COVID-19 pandemic on the company's business and

operations; as well as the other risks and uncertainties set forth in the “Risk Factors” section of our most recent annual report on Form 10-K and quarterly report on Form 10-Q, which are on file with the Securities and Exchange Commission, and in subsequent filings the company may make with the Securities and Exchange Commission. In addition, the forward-looking statements included in this press release represent the company’s views as of the date hereof. The company anticipates that subsequent events and developments will cause the company’s views to change. However, while the company may elect to update these forward-looking statements at some point in the future, the company specifically disclaims any obligation to do so. These forward-looking statements should not be relied upon as representing the company’s views as of any date subsequent to the date on which they were made.

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