Beam Therapeutics Presents First In Vivo Data Demonstrating Potential of Multiplex Base Editing Approach to Target Disease Drivers of Chronic Hepatitis B Infection

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CAMBRIDGE, Mass., Sept. 19, 2022 (GLOBE NEWSWIRE) -- Beam Therapeutics Inc. (Nasdaq: BEAM), a biotechnology company developing precision genetic medicines through base editing, today announced new preclinical data demonstrating the potential of the company's multiplex base editing approach to both reduce viral markers – including hepatitis B surface antigen (HBsAg) expression – and prevent viral rebound of hepatitis B virus (HBV) in *in vivo* models. The data will be presented today, September 19, 2022, in partnership with Fabien Zoulim's laboratory at the INSERM Cancer Research Center of Lyon, during a poster presentation titled, "Cytosine base editing inhibits Hepatitis B Virus replication and reduces HBsAg expression *in vitro* and *in vivo*," at the 2022 International HBV Meeting.

HBV causes serious liver infection that can become chronic, increasing the risk of developing life-threatening health issues like cirrhosis, liver failure or liver cancer. Chronic HBV infection is characterized by the persistence of covalently closed circular DNA (cccDNA), a unique DNA structure that forms in response to HBV infection in the nuclei of liver cells. Additionally, the HBV DNA integrates into the human genome, becoming a source of HBsAg. While currently available treatments can limit HBV replication, they do not inactivate these HBV genomic elements, which can lead to reinfection and reactivation of the HBV virus. This inability to prevent HBV infection rebound is a key challenge to curing HBV.

Base editors are designed to enable direct and irreversible conversion of a specific DNA base into another without inducing double-stranded breaks. In HBV infected cells, cytosine base editors (CBEs) can target both integrated HBV DNA and the cccDNA minichromosome at multiple locations, introducing precise and permanent stop codons in the viral genome. These stop codons are intended to silence the viral genes without the risk of chromosomal rearrangements that can arise with nuclease editing systems that create double-stranded breaks in DNA.

"Chronic HBV infection remains a major global health problem, and despite available antiviral medications, there is a significant need for a treatment that can both prevent viral replication and reduce viral protein expression," said Giuseppe Ciaramella, Ph.D., president and chief scientific officer of Beam. "We are very excited to share these new data, highlighting the ability of our multiplex base editing approach to address both of these disease drivers of HBV infection in *in vivo* models for the first time. By preventing viral replication and silencing viral protein expression, this approach could represent a potentially curative option for the millions of people with HBV around the world. We look forward to continuing to explore its utility in additional preclinical studies."

The data announced today build on previously shared *in vitro* data, which demonstrated the ability of HBV-targeting gRNAs and mRNA-encoding CBEs to introduce stop codons in HBV DNA leading to a substantial reduction of relevant HBV viral markers (HBsAg, HBeAg, HBV DNA, 3.5kb RNA). Based on those findings, Beam evaluated its approach *in vivo* in an HBV minicircle mouse model, with mice receiving one or two doses of the base editing reagents (mRNA & gRNA formulated into a lipid nanoparticle (LNP)), the antiviral treatment entecavir or control. Findings show that:

- Base editing treatment led to a sustained >2 log10 IU/ml reduction of HBsAg observed in both LNP dose groups, compared to entecavir or control mice, in which no meaningful reductions were observed.
- Base editing treatment led to sustained 3 log10 copies/ml reduction in serum HBV DNA with no HBV viral rebound observed compared to the entecavir group in which serum HBV DNA was reduced following administration but rebounded after entecavir treatment was discontinued.

Taken together, the findings demonstrate that base editing has the potential to permanently inactivate cccDNA and integrated HBV DNA by introducing mutations that prevent HBV replication and silence viral protein expression.

About Beam Therapeutics
Beam Therapeutics (Nasdaq: BEAM) is a biotechnology company committed to establishing the leading, fully integrated platform for precision genetic medicines. To achieve this vision, Beam has assembled a platform that includes a suite of gene editing and delivery technologies and is in the process of building internal manufacturing capabilities. Beam's suite of gene editing technologies is anchored by base editing, a proprietary technology that is designed to enable precise, predictable and efficient single base changes, at targeted genomic sequences, without making double-stranded breaks in the DNA. This has the potential to enable a wide range of potential therapeutic editing strategies that Beam is using to advance a diversified portfolio of base editing programs. Beam is a values-driven organization committed to its people, cutting-edge science, and a vision of providing life-long cures to patients suffering from serious diseases.

Cautionary Note Regarding Forward-Looking Statements
This press release contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Investors are cautioned not to place undue reliance on these forward-looking statements, including, but not limited to, statements related to: Beam's presentation at the 2022 International HBV Meeting and the therapeutic applications and potential of our technology, including with respect to our ability to develop life-long, curative, precision genetic medicines for patients through base editing. Each forward-looking statement is subject to important risks and uncertainties that could cause actual results to differ materially from those expressed or implied in such statement, including, without limitation, risks and uncertainties related to: our ability to develop, obtain regulatory approval for, and commercialize our product candidates, which may take longer or cost more than planned; our ability to raise additional funding, which may not be available; our ability to obtain, maintain and enforce patent and other intellectual property protection for our product candidates; the potential impact of the COVID-19 pandemic; that preclinical testing of our product candidates and preliminary or interim data from preclinical studies and clinical trials may not be predictive of the results or success of ongoing or later clinical trials; that enrollment of our clinical trials may take longer than expected; that our product candidates may experience manufacturing or supply

interruptions or failures; risks related to competitive products; and the other risks and uncertainties identified under the headings “Risk Factors Summary” and “Risk Factors” in our Annual Report on Form 10-K for the year ended December 31, 2021, under the heading “Risk Factors” in our Quarterly Report on Form 10-Q for the quarter ended June 30, 2022, and in any subsequent filings with the Securities and Exchange Commission. These forward-looking statements speak only as of the date of this press release. Factors or events that could cause our actual results to differ may emerge from time to time, and it is not possible for us to predict all of them. We undertake no obligation to update any forward-looking statement, whether as a result of new information, future developments or otherwise, except as may be required by applicable law.

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