Assembly Biosciences Presents New Data at AASLD The Liver Meeting® Highlighting Breadth of Virology Portfolio and Potential of Next-Generation Core Inhibitors in HBV

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Data demonstrating nanomolar potency of core inhibitor ABI-4334 to disrupt the hepatitis B virus (HBV) life cycle at multiple points supports advancement into clinical studies

First data presented on preclinical characterization of potent, orally bioavailable viral entry inhibitors for HBV and hepatitis D virus (HDV)

First data presented on novel series of orally bioavailable small molecule interferon-a receptor (IFNAR) agonists designed to inhibit HBV and engage the immune system with potential to offer improved tolerability

SOUTH SAN FRANCISCO, Calif., Nov. 04, 2022 (GLOBE NEWSWIRE) -- Assembly Biosciences, Inc. (Nasdaq: ASMB), a clinical-stage biotechnology company developing innovative, investigational therapeutics targeting hepatitis B virus (HBV) and other viral diseases, today reported clinical and preclinical data from its virology portfolio at the American Association for the Study of Liver Diseases (AASLD), The Liver Meeting®. The new data are being presented at the conference as part of four poster presentations, including two late breaker presentations.

"The data presented at AASLD's The Liver Meeting demonstrate the significant progress that we are making in advancing and broadening our early-stage virology programs. These presentations highlight the strength of our research capabilities and the deep virology experience across the team," said William Delaney, PhD, chief scientific officer of Assembly Bio. "Preclinical data presented from our 4334 program further demonstrate and detail the activity of this next-generation core inhibitor that has been optimized for significantly increased potency against cccDNA formation. Additionally, the first presentation of preclinical data from our small molecule HBV/HDV entry inhibitor and IFNAR agonist programs provides support for our continued advancement of these approaches toward clinical development. We remain committed to our goal of discovering and developing novel antivirals that change the treatment paradigm for serious viral diseases. We are particularly focused on the urgent need for curative and finite therapies for chronic hepatitis B patients and better treatment options for patients chronically infected with HDV."

In the poster entitled "*ABI-4334, a novel hepatitis B core inhibitor, accelerates capsid assembly and inhibits cccDNA formation via multiple pathways,"* preclinical data are presented that further demonstrate and detail the core inhibitor activity of ABI-4334 (4334) against pgRNA encapsidation and covalently closed circular DNA (cccDNA) formation. These activities were demonstrated to be due in part to the ability of 4334 to both accelerate formation of empty capsids as well as prematurely disrupt intact capsids. 4334 demonstrates low or subnanomolar potency against both DNA replication and cccDNA formation, with EC_{50} concentrations well below the predicted minimum plasma concentration. Further, this study represents the first time in which a core inhibitor has demonstrated the unique ability to prematurely disrupt capsids containing DL-DNA, which has the potential to impact HBV integration. These data support the advancement of 4334 into Phase 1 clinical studies.

A novel class of highly potent, orally bioavailable HBV and HDV entry inhibitors is highlighted in the poster entitled "*Preclinical Characterization of a Novel Class of Highly Potent Small Molecule Hepatitis B and D Virus Entry Inhibitors."* This class of compounds exhibit nanomolar activity *in vitro* to inhibit HBV and HDV infection in hepatic cells. Further, these compounds have demonstrated an ability to inhibit preS1 binding to NTCP, the functional receptor for HBV and HDV uptake, and to inhibit NTCP-mediated bile acid uptake, further supporting that they target NTCP. In preclinical pharmacokinetic (PK) studies, this class of molecules demonstrate favorable PK properties including high permeability and bioavailability and potential for once daily dosing in patients. Lead optimization for this series is in progress at Assembly Bio, with candidate nomination anticipated in 2023.

In the late-breaking poster entitled "*Preclinical characterization of a novel liver-focused small molecule efficiently inhibiting hepatitis B virus by activating type I interferon signaling,"* data is focused on a novel class of orally bioavailable interferon-alpha receptor (IFNAR) agonists that efficiently inhibit HBV as well as other viruses. Unlike core inhibitors or entecavir, these compounds inhibit HBsAg production whether administered before infection or after the establishment of cccDNA. The agonists were shown to activate IFNa signaling via the JAK–STAT pathway, leading to induction of interferon-stimulated genes. Additionally, preliminary data suggest that this class of compounds can induce long-lasting antiviral effects when cells were exposed to compounds for even brief periods of time (15 minutes). PK studies demonstrate that these agonists have good oral bioavailability and the half-life can be modulated based on structure. Lead optimization of multiple agonists is in progress.

Clinical results from the study evaluating first-generation core inhibitor vebicorvir (VBR) in combination with Arbutus Biopharma's AB-729 in HBV are presented in the late-breaking poster entitled *"Evaluation of the vebicorvir, NrtI, and AB-729 combination in*

virologically suppressed patients with HBeAg negative chronic hepatitis B virus infection: Interim analysis from an open label phase 2 study." Data from this clinical trial indicate that all regimens tested were generally well tolerated. The interim data further suggest that the addition of VBR to AB-729 plus treatment with a nucleos(t)ide reverse transcriptase inhibitor (NrtI) does not result in notably greater on-treatment improvements in markers of active HBV infection compared with AB-729+NrtI. No patient achieved HBsAg loss or HBsAg seroconversion during the 48-week on-treatment period.

AASLD Presentations and Posters

Presentations and posters are expected to be made available online to conference registrants through The Liver Meeting Digital Experience™ at https://www.aasld.org/the-liver-meeting/digital-experience within 72 hours of presentation. The full posters are also now available online at the "Events & Presentations" page in the "Investors" section of Assembly's website at **www.assemblybio.com**.

About Assembly Biosciences

Assembly Bio is a clinical-stage biotechnology company pioneering the development of novel therapeutics for serious viral diseases. Assembly Bio is advancing a leading portfolio of more potent, next-generation core inhibitor drug candidates that aim to break the complex viral replication cycle of hepatitis B virus (HBV) to achieve finite and potentially curative therapies for the 296 million people living with HBV worldwide. The company's research pipeline includes differentiated antiviral approaches against HBV/hepatitis delta virus and herpesviruses. For more information, visit assemblybio.com.

Forward-Looking Statements

The information in this press release contains forward-looking statements that are subject to certain risks and uncertainties that could cause actual results to materially differ. These risks and uncertainties include: Assembly Bio's ability to successfully execute its previously announced reprioritization and restructuring activities, including the CEO transition; potential adverse legal, reputational, operational and financial effects on Assembly Bio resulting from the reprioritization and restructuring activities; Assembly Bio's ability to initiate and complete clinical studies involving its therapeutic product candidates, including studies contemplated by Assembly Bio's collaboration agreements, in the currently anticipated timeframes; safety and efficacy data from clinical studies may not warrant further development of Assembly Bio's product candidates; clinical and nonclinical data presented at conferences may not differentiate Assembly Bio's product candidates from other companies' candidates; results of nonclinical studies may not be representative of disease behavior in a clinical setting and may not be predictive of the outcomes of clinical studies; continued development and commercialization of ABI-H3733, if successful, in the China territory will be dependent on, and subject to, Assembly Bio's collaboration agreement governing this activity in the China territory; Assembly Bio's ability to maintain financial resources necessary to continue its clinical studies and fund business operations; any impact that the COVID-19 pandemic may have on Assembly Bio's business and operations, including initiation, enrollment and continuation of its clinical studies or timing of discussions with regulatory authorities; and other risks identified from time to time in Assembly Bio's reports filed with the U.S. Securities and Exchange Commission (the SEC). You are urged to consider statements that include the words may, will, would, could, should, might, believes, hopes, estimates, projects, potential, expects, plans, anticipates, intends, continues, forecast, designed, goal or the negative of those words or other comparable words to be uncertain and forward-looking. Assembly Bio intends such forward-looking statements to be covered by the safe harbor provisions contained in Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. More information about Assembly Bio's risks and uncertainties are more fully detailed under the heading "Risk Factors" in Assembly Bio's filings with the SEC, including its most recent Annual Report on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K. Except as required by law, Assembly Bio assumes no obligation to update publicly any forward-looking statements, whether as a result of new information, future events or otherwise.

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