Clinical Data from Assembly Biosciences' HBV Core Inhibitors Presented at The Digital International Liver CongressTM EASL 2020

August 28, 2020

SOUTH SAN FRANCISCO, Calif., Aug. 28, 2020 (GLOBE NEWSWIRE) -- Assembly Biosciences, Inc. (Nasdaq: ASMB), a clinical-stage biotechnology company developing innovative therapeutics targeting hepatitis B virus (HBV) and diseases associated with the microbiome, announced that clinical data for its lead HBV core inhibitor vebicorvir (VBR, or ABI-H0731), its second-generation core inhibitor ABI-H2158, as well as its highly sensitive HBV assays were highlighted during The Digital International Liver Congress™(ILC), the Annual Meeting of the European Association for the Study of the Liver (EASL).

"The long-term clinical data in a broad patient population continue to demonstrate vebicorvir's favorable safety profile and ability to achieve deeper reductions in HBV DNA and pgRNA than the current standard of care alone," said Scott Fung, MD, FRCPC, Associate Professor, Department of Medicine, University of Toronto. "A combination therapy resulting in improved viral suppression also has the potential to result in higher off-treatment response rates, which would be an important advancement for the field of HBV and the millions of patients living with this chronic disease."

"This has been an important year of progress and execution across our portfolio of HBV core inhibitors," said John McHutchison, AO, MD, Chief Executive Officer and President of Assembly. "At EASL this year, we are pleased to share four presentations with the medical and scientific communities. We believe that core inhibitors are central to future finite and also curative strategies for chronic HBV infection, and we look forward to moving ahead with current and additional trials as we drive toward these goals for patients living with this disease. To that end, we are excited that patients meeting the stopping criteria continue coming off treatment with vebicorvir and standard-of-care therapy in our Phase 2 open-label extension study. We are now following these patients to assess for sustained virologic response (SVR) following treatment."

EASL Digital International Liver Congress Presentations
The oral presentation and posters are available in the Investors section of Assembly's website.

Vebicorvir (VBR, or ABI-H0731), Assembly's Lead HBV Core Inhibitor
Oral Presentation AS070: Antiviral activity and safety of the hepatitis B core inhibitor ABI-H0731 administered with a nucleos(t)ide reverse transcriptase inhibitor (NrtI) in patients with HBeAg-negative chronic hepatitis B infection
Lead Author: Scott Fung, MD, FRCPC, Associate Professor, Department of Medicine, University of Toronto

Key Results:

- Assembly's novel core inhibitor vebicorvir in combination with standard-of-care NrtI continues to demonstrate a favorable safety and tolerability profile, with no observed treatment-emergent resistance in patients with HBeAg negative chronic HBV infection in this ongoing Phase 2 clinical trial (Study 211).
- Approximately 30% of patients were virologically-suppressed at baseline as measured by commercial assays but had evidence of residual viral replication using Assembly's highly sensitive HBV DNA assay. This viral replication was detected even though these patients had received chronic, long-term NrtI therapy (mean duration 4 years).
- After adding VBR to chronic NrtI therapy, nearly all patients reached undetectable levels of HBV DNA.
- All patients have achieved HBV DNA + pgRNA levels less than the limit of quantification by Assembly's highly sensitive composite assay, which is a component of the study's stopping criteria.
- Assembly continues to project that approximately 88% of patients initially enrolled in Study 211 will achieve its stopping criteria and will be taken off therapy to be assessed for SVR.

Late-Breaking Poster LBP30: Antiviral activity and safety of the hepatitis B core inhibitor ABI-H0731 administered with a nucleos(t)ide reverse transcriptase inhibitor in patients with HBeAg-positive chronic hepatitis B infection in a long-term extension study
Lead Author: Man-Fung Yuen MD, PhD, Chief of Division of Gastroenterology and Hepatology, Queen Mary Hospital, Hong Kong

Key Results:

- Vebicorvir in combination with NrtI continues to demonstrate a favorable safety and tolerability profile, with no observed treatment-emergent resistance in patients with HBeAg positive chronic HBV infection in Study 211.
- In treatment-naïve patients with HBeAg positive chronic HBV infection:
    - The addition of VBR to NrtI therapy led to greater declines in HBV DNA and pgRNA and ALT normalization.

    - Currently, it is projected that approximately 65% of these patients will achieve an initial virologic response and extend treatment with VBR and NrtI for an additional 48 weeks to enable these patients to reach the stopping criteria.
- In virologically-suppressed patients with HBeAg positive chronic HBV infection:
    - The addition of VBR to NrtI therapy led to greater proportions of patients achieving undetectable HBV DNA and pgRNA levels, as measured by Assembly's highly sensitive HBV nucleic acid assays.
    - Assembly continues to project that approximately 49% of these patients initially enrolled in Study 211 will achieve its stopping criteria to be taken off therapy to be assessed for SVR.

ABI-H2158, Assembly's Second-Generation HBV Core Inhibitor
Late-Breaking Poster LBP05: Antiviral activity, pharmacokinetics and safety of the second-generation hepatitis B core inhibitor ABI-H2158 in a Phase 1b study of patients with HBeAg-positive chronic hepatitis B infection
Lead Author: Kosh Agarwal, MD, Kings College Hospital, London

Key Results:

- Assembly's second-generation core inhibitor ABI-H2158 is approximately ten-fold more potent against cccDNA formation than its first-generation core inhibitor VBR in preclinical *in vitro* assays.
- In this Phase 1b dose-ranging clinical trial, ABI-H2158 demonstrated a favorable safety profile when orally administered for 14 days at doses of 100, 300, and 500 mg daily.
- Dose-dependent reductions in HBV DNA and pgRNA were observed.
- At the 300-mg dose, the mean decline from baseline to day 15 in HBV DNA and pgRNA levels were 2.5 $\log_{10}$ IU/mL and 2.3 $\log_{10}$ U/mL, respectively.
- ABI-H2158 is being evaluated in an ongoing randomized, placebo-controlled Phase 2 clinical trial (n=80) where treatment-naïve patients with HBeAg positive chronic HBV infection are being treated with ABI-H2158 at the 300 mg dose in combination with entecavir.

Assembly's Highly Sensitive HBV Assays
Poster FRI403: Development of a highly sensitive multiplex platform assay to monitor low levels of HBV DNA and pgRNA in samples from patients with chronic hepatitis B
Lead Author: Qi Huang, PhD, Vice President, Virology Discovery, Assembly Biosciences

Key Highlights:

- There is a need for new assays as the HBV field moves toward finite treatment.
    - Assembly's assays provide greater sensitivity than the currently available commercial HBV DNA assays.
    - There are no approved assays for HBV pgRNA, and recent research suggests that pgRNA is associated with persistent HBV replication and pgRNA negativity is a predictive marker for off-treatment response.
- In samples from virologically-suppressed patients on chronic NrtI therapy in Study 201, the majority of patients who were negative for HBV DNA <20 IU/mL as measured by the COBAS assay were found to be positive using Assembly's highly sensitive HBV Total Nucleic Acids assay. This demonstrates the limitations of current commercial assays.
- Assembly's composite quantitative PCR assay allows for simultaneous detection and measurement of HBV Total Nucleic Acids (HBV DNA and HBV pgRNA), which has been incorporated in guiding treatment discontinuation decisions.

About Assembly Biosciences' HBV Core Inhibitor Portfolio
Assembly's HBV portfolio includes three clinical-stage small molecule candidates, all of which are HBV core inhibitors that target multiple steps of the HBV lifecycle. In Phase 2 clinical trials, first-generation core inhibitor vebicorvir (VBR, or ABI-H0731) administered with nucleos(t)ide analogue reverse transcriptase inhibitor (NrtI) therapy has been well-tolerated, has shown statistically superior antiviral activity in HBV DNA suppression compared to NrtI therapy alone, and has demonstrated significant declines in HBV pgRNA that may indicate decreased cccDNA levels. In the ongoing Phase 2 open-label extension trial, Assembly has begun transitioning patients off combination therapy, to then monitor for sustained virologic response (SVR).

Assembly's HBV portfolio also includes two more potent, second-generation candidates, ABI-H2158 in a Phase 2 clinical trial and ABI-H3733 in Phase 1 development.

Vebicorvir and ABI-H2158 both have been granted Fast Track designation by the U.S. Food and Drug Administration for the treatment of chronic HBV infection.

About HBV
Chronic hepatitis B virus (HBV) infection is a debilitating disease of the liver that afflicts over 250 million people worldwide with up to 90 million people in China, as estimated by the World Health Organization. HBV is a global epidemic that affects more people than hepatitis C virus (HCV) and HIV infection combined—with a higher morbidity and mortality rate. HBV is a leading cause of

chronic liver disease and need for liver transplantation, and up to one million people worldwide die every year from HBV-related causes.

The current standard of care for patients with chronic HBV infection is life-long suppressive treatment with medications that reduce, but do not eliminate, the virus, resulting in very low cure rates. There is a significant unmet need for new therapies to treat HBV.

About Assembly Biosciences

Assembly Biosciences, Inc. is a clinical-stage biotechnology company developing innovative therapeutics targeting hepatitis B virus (HBV) and diseases associated with the microbiome. The HBV program is focused on advancing a new class of potent, oral core inhibitors that have the potential to increase cure rates for chronically infected patients. The microbiome program is developing novel oral live microbial biotherapeutic candidates with Assembly's fully integrated platform, including a robust process for strain identification and selection, GMP manufacturing expertise and targeted delivery to the lower gastrointestinal tract with the GEMICEL® technology. 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's ability to initiate and complete clinical trials involving its HBV Cure therapeutic product candidates in the currently anticipated timeframes; safety and efficacy data from clinical studies may not warrant further development of Assembly's product candidates; clinical and nonclinical data presented at conferences may not differentiate Assembly's product candidates from other companies' candidates; Assembly may not observe sustained virologic response in patients who stop therapy in Study 211; Assembly's ability to maintain financial resources necessary to continue its clinical trials and fund business operations; any impact that the spread of the coronavirus and resulting COVID-19 pandemic may have on Assembly's business and operations, including initiation and continuation of its clinical trials or timing of discussions with regulatory authorities; and other risks identified from time to time in Assembly'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 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's risks and uncertainties are more fully detailed under the heading "Risk Factors" in Assembly'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 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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