Altimmune Announces Positive Topline Results from 24-Week (12-Week Extension) Trial of Pemvidutide in Subjects with Non-Alcoholic Fatty Liver Disease (NAFLD)

December 20, 2022

- *Greater than 75% relative reduction in liver fat content achieved at the 1.8 mg and 2.4 mg doses at 24 weeks*
- *Significant reductions in serum alanine aminotransferase (ALT) and corrected T1 (cT1) observed, both established markers of liver inflammation*
- *Mean weight loss of 7.2% (placebo adjusted 6.0%) in subjects without diabetes at the 1.8 mg dose*
- *Glycemic control maintained with trends toward improvements in fasting glucose and HbA1c in subjects with diabetes*
- *Meaningful reductions in blood pressure with minimal increases in heart rate*
- *Altimmune to host conference call today at 8:30 am ET*

GAITHERSBURG, Md., Dec. 20, 2022 (GLOBE NEWSWIRE) -- Altimmune, Inc. (Nasdaq: ALT), a clinical-stage biopharmaceutical company, today announced topline results from its 24-week (12-week extension) trial of pemvidutide in subjects with NAFLD.

Sixty-six (66) of the 83 subjects who completed the initial 12-week Phase 1b NAFLD trial consented to participate in this 12-week extension trial to receive a total of 24 weeks of treatment, and 64 subjects were enrolled. The trial was conducted without adjunctive diet and exercise interventions and the double-blinding of the trial was maintained during the extension study. The same endpoints as the 12-week parent NAFLD trial were employed, with a primary efficacy endpoint of percent (%) reduction in liver fat content; key secondary endpoints were reduction in liver inflammation, as measured by serum ALT levels and cT1, and percent weight loss.

The population of the 12-week extension trial had similar baseline characteristics as the population of the parent, 12-week Phase 1b NAFLD trial. At baseline, across all treatment groups, mean BMI was 36.7 kg/m^2 and mean liver fat content (LFC), as measured by MRI-PDFF, was 22.2%. Type 2 diabetes was present in 26.6% of subjects and 73.4% of study subjects were of Hispanic ethnicity.

The trial met its primary endpoint in all pemvidutide treatment groups. At the 1.8 mg and 2.4 mg doses, subjects receiving pemvidutide achieved mean relative reductions of liver fat content of 75.2% and 76.4%, respectively; 92.3% and 100% of subjects, respectively, achieved a 30% reduction in liver fat, 84.6% and 72.7% of subjects, respectively, achieved a 50% reduction in liver fat, and 53.8% and 45.5% of subjects, respectively, achieved normalization of liver fat, defined as liver fat fraction of 5% or less. Statistically significant declines in mean serum ALT levels were observed in all pemvidutide-treated subjects, and in subjects with baseline serum ALT ≥30 IU/L, ALT levels declined at least 17 IU/L at all pemvidutide dose levels. In a subset of subjects evaluated for cT1 response, 75.0% and 100% of subjects receiving 1.8 mg or 2.4 mg pemvidutide, respectively, achieved an 80 millisecond (ms) decrease in cT1. Elevated cT1 levels have been associated with increased risk of major adverse cardiac events (MACE) and major adverse liver outcomes (MALO), and an 80 ms reduction has been associated with a 2-point reduction of NAFLD Activity Score (NAS).

The trial also met its key secondary weight loss endpoint in all pemvidutide treatment groups. Employing an efficacy estimand, mean weight losses of 7.2% (placebo-adjusted 6.0%) in subjects without diabetes and 6.2% (placebo-adjusted 4.8%) in all subjects were achieved at the 1.8 mg dose.

Pemvidutide was generally well tolerated. A total of 3 serious or severe adverse events (AEs) were reported, each unrelated to study drug administration (chest pain post-elective cardiac stent placement; Salmonella infection; and hypertension greater than 3 weeks after the completion of treatment). Three AEs led to treatment discontinuation, 1 being the Salmonella infection, and 2 gastrointestinal AEs, 1 (6.3%) at the 1.2 mg dose and 1 (6.7%) at the 1.8 mg dose. As expected, gastrointestinal events comprised the majority of AEs and were predominantly mild in nature. No clinically significant ALT elevations were observed. Glycemic control was maintained, with pemvidutide groups demonstrating trends toward improvements in fasting glucose and HbA1c over the 24 weeks of treatment. Meaningful reductions in systolic blood pressure were observed, and increases in heart rate, typical of the incretin class of agents, were minimal at 0 to 4 beats per minute and independent of dose.

“We have seen in recent study announcements that the magnitudes of change in non-invasive markers like liver fat reduction and ALT are associated with improvement in non-alcoholic steatohepatitis (NASH) histopathology. The impressive results announced today suggest a high likelihood of success on histopathological assessment in Phase 2b,” said Stephen Harrison, M.D., Chairman and Co-Founder of Pinnacle Clinical Research and Summit Clinical Research. “Effective weight loss is also extremely important for these patients, as many suffer from metabolic co-morbidities such as obesity, hyperlipidemia and diabetes putting them at greater risk for cardiovascular disease. I believe pemvidutide is one of the few candidate drugs for NASH with the potential to deliver in a meaningful way on both NASH activity and weight loss and that the magnitude and consistency of these results place pemvidutide among the most promising agents in development for NASH.”

“These results, which include some of the most compelling reductions in liver fat content observed to date, together with robust reductions in ALT and cT1, highlight the potential for pemvidutide to achieve significant rates of NASH resolution and fibrosis improvement in biopsy-driven NASH trials,” said Vipin K. Garg, Ph.D., President and Chief Executive Officer of Altimmune. “We believe that both NASH and obesity are important value drivers of our pemvidutide program. We look forward to the weight loss data from the interim analysis of our MOMENTUM obesity trial in Q1 2023 and commencing a Phase 2b NASH trial in 2023.”

Summary of Efficacy Findings

Endpoint	Treatment			
	Placebo	**1.2 mg**	**1.8 mg**	**2.4 mg**
Primary Endpoint—Liver Fat Content	**n = 18**	**n=14**	**n=13**	**n=11**
Liver fat reduction, absolute, % change, LSM (SE)	1.6 (0.8)	11.2 (2.3) ***	17.0 (2.4) ***	15.6 (2.1) ***

Liver fat reduction, relative, % change, LSM (SE)	14.0 (3.8)	56.3 (11.6) ***	75.2 (8.1) ***	76.4 (5.9) ***
Proportion of subjects with 30% reduction, (%)	5.6	76.9 ****	92.3 ****	100.0 ****
Proportion of subjects with 50% reduction, (%)	0.0	61.5 ***	84.6 ****	72.7 ****
Proportion of subjects with normalization, (%)	0.0	30.8 *	53.8 ***	45.5 **
Secondary Endpoint—Markers of Inflammation				
ALT, change from baseline, IU/L, LSM (SE)	**n = 19**	**n=16**	**n=15**	**n=14**
	-2.2 (2.5)	-13.3 (3.7) **	-13.7 (5.1) **	-15.2 (5.8) **
ALT, change from baseline, IU/L, LSM (SE), baseline ≥ 30 IU/L	**n = 13**	**n=7**	**n=10**	**n=9**
	-3.1 (3.5)	-17.0 (7.6) *	-17.7 (7.2) *	-20.6 (9.8) *
Proportion of subjects with cT1 response, (%)	**n = 6**	**n=7**	**n=4**	**n=2**
	0.0	85.7 **	75.0 *	100.0 *
Secondary Endpoint—Weight Loss				
Weight loss, no diabetes, (% change), LSM (SE)	**n = 14**	**n=13**	**n=9**	**n=11**
	1.2 (0.7)	5.2 (1.7) **	7.2 (1.1) ***	5.8 (1.6) **
Weight loss, diabetes, (% change), LSM (SE) †	**n = 5**	**n=3**	**n=6**	**n=3**
	3.4 (2.1)	4.3 (1.9)	5.3 (2.7)	3.5 (2.5)
Weight loss, all subjects, (% change), LSM (SE)	**n = 19**	**n=16**	**n=15**	**n=14**
	1.4 (0.7)	5.1 (1.4) **	6.2 (1.3) ***	5.2 (1.4) **

Normalization of liver fat defined as ≤ 5%; cT1 response define as an 80 ms change from baseline; LSM, least square mean
† High variability due to the small numbers of diabetic subjects (n = 5, 3, 6, 3 in respective treatment groups)
*p < .05; ** p < 0.01, *** p < 0.001, ****p < 0.0001 compared with placebo.

Glycemic Control

Characteristic	**Treatment**			
	Placebo	**1.2 mg**	**1.8 mg**	**2.4 mg**
Non-diabetes	**n=14**	**n=13**	**n=9**	**n=11**
Fasting glucose				
Baseline, mg/dL, mean (SD)	96.2 (12.4)	99.4 (11.9)	96.0 (12.4)	99.3 (13.6)
Week 24, mg/dL, mean (SD)	93.3 (12.1)	99.1 (13.1)	96.9 (12.5)	98.4 (24.5)
HbA1c				
Baseline, %, mean (SD)	5.8 (0.2)	5.7 (0.3)	5.7 (0.2)	5.5 (0.4)
Week 24, %, mean (SD)	5.7 (0.3)	5.8 (0.3)	5.8 (0.3)	5.6 (0.3)
Diabetes	**n=5**	**n=3**	**n=6**	**n=3**
Fasting glucose				
Baseline, mg/dL, mean (SD)	111.5 (19.2)	132.1 (28.2)	120.2 (37.1)	147.4 (40.4)
Week 24, mg/dL, mean (SD)	109.4 (14.8)	123.4 (50.8)	109.0 (13.1)	75.5 (29.0)
HbA1c				
Baseline, %, mean (SD)	6.1 (0.6)	7.8 (1.4)	6.4 (0.5)	6.8 (1.3)
Week 24, %, mean (SD)	6.4 (1.1)	7.4 (2.3)	6.4 (0.3)	6.3 (1.3)

Summary of Safety Findings

Characteristic			**Treatment**			
			Placebo (n = 19)	**1.2 mg (n=16)**	**1.8 mg (n=15)**	**2.4 mg (n=14)**
Serious or severe AEs		n (%)	1 (5.3%)	1 (6.3%)	1 (6.7%)	0 (0.0 %)
AEs leading to treatment discontinuation		n (%)	0 (0.0%)	2 (12.5%)	1 (6.7%)	0 (0.0%)
Nausea	Mild	n (%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (7.1%)
	Moderate	n (%)	0 (0.0%)	0 (0.0%)	3 (20.0%)	0 (0.0%)
Vomiting	Mild	n (%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Moderate	n (%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Diarrhea	Mild	n (%)	1 (5.3%)	0 (0.0%)	1 (6.7%)	0 (0.0%)
	Moderate	n (%)	0 (0.0%)	1 (6.3%)	0 (0.0%)	0 (0.0%)
Constipation	Mild	n (%)	0 (0.0%)	0 (0.0%)	1 (6.7%)	0 (0.0%)
	Moderate	n (%)	1 (5.3%)	1 (6.3%)	0 (0.0%)	0 (0.0%)

Systolic Blood Pressure, mm Hg, LSM (SE)	-2.3 (2.8)	-10.1 (4.2) *	-5.5 (3.7)	-12.0 (3.5) *
Diastolic Blood Pressure, mm Hg, LSM (SE)	-2.5 (1.5)	-2.9 (2.6)	-4.0 (3.7)	-3.8 (2.8)

Heart Rate, mmHg, LSM (SE)	-1.0 (1.7)	3.7 (1.8)	0.5 (2.8)	-0.1 (1.8)

A total of 3 serious or severe adverse events (AEs) were reported, each unrelated to study drug administration (chest pain post-elective cardiac stent placement; Salmonella infection; and hypertension greater than 3 weeks after the completion of treatment), with only the Salmonella infection leading to treatment discontinuation. The other AEs leading to treatment discontinuation were mild (Grade 1) abdominal pain in 2 subjects. No significant ALT elevations were reported. *p < .05 compared with placebo.

About Pemvidutide

Pemvidutide is a novel, investigational, peptide-based GLP-1/glucagon dual receptor agonist in development for the treatment of obesity and NASH. Activation of the GLP-1 and glucagon receptors is believed to mimic the complementary effects of diet and exercise on weight loss, with GLP-1 suppressing appetite and glucagon increasing energy expenditure. Glucagon is also recognized as having direct effects on hepatic fat metabolism, leading to rapid reductions in levels of liver fat. Pemvidutide incorporates the EuPort™ domain, a proprietary technology that increases its serum half-life for weekly dosing while likely slowing the entry of pemvidutide into the bloodstream, which may improve its tolerability. At both 12 and 24 weeks of Phase 1b clinical trials, NAFLD subjects treated with pemvidutide demonstrated promising reductions in liver fat content, serum ALT levels and body weight.

Conference Call Information
Altimmune management will host a conference call and webcast with a slide presentation presented by Dr. Stephen A. Harrison beginning at 8:30 am E.T. Following the conclusion of the call, the webcast will be available for replay on the Investor Relations page of the Company's website at www.altimmune.com. The Company has used, and intends to continue to use, the IR portion of its website as a means of disclosing material non-public information and for complying with disclosure obligations under Regulation FD.

Conference Call Information:

Date:	Tuesday, December 20
Time:	8:30 am Eastern Time
Webcast:	To listen, the conference call will be webcast live on Altimmune's Investor Relations website at https://ir.altimmune.com/investors.
Dial-in:	To participate or dial-in, register here to receive the dial-in numbers and unique PIN to access the call.

About Altimmune

Altimmune is a clinical-stage biopharmaceutical company focused on the development of novel peptide-based therapeutics for the treatment of obesity and liver diseases. The Company's lead product candidate, pemvidutide (ALT-801), is a GLP-1/glucagon dual receptor agonist that is being developed for the treatment of obesity and NASH. In addition, Altimmune is developing HepTcell™, an immunotherapeutic designed to achieve a functional cure for chronic hepatitis B. For more information, please visit www.altimmune.com.

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Forward-Looking Statement

Any statements made in this press release relating to future financial or business performance, conditions, plans, prospects, trends, or strategies and other financial and business matters, including without limitation, the timing of key milestones for our clinical assets, the timing of the data readouts of the NAFLD trials, the Phase 2 obesity clinical trial of pemvidutide, and the prospects for regulatory approval, commercializing or selling any product or drug candidates, are forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. In addition, when or if used in this press release, the words "may," "could," "should," "anticipate," "believe," "estimate," "expect," "intend," "plan," "predict" and similar expressions and their variants, as they relate to Altimmune, Inc. (the "Company") may identify forward-looking statements. The Company cautions that these forward-looking statements are subject to numerous assumptions, risks, and uncertainties, which change over time. Important factors that may cause actual results to differ materially from the results discussed in the forward looking statements or historical experience include risks and uncertainties, including risks relating to: potential impacts from the ongoing conflict in Ukraine and the COVID-19 pandemic, such as delays in regulatory review, manufacturing and supply chain interruptions, access to clinical sites, enrollment, adverse effects on healthcare systems and disruption of the global economy; the impact of liver fat content and demographics in the Phase 1b NAFLD study on the success of future trials; the reliability of the results of studies relating to human safety and possible adverse effects resulting from the administration of the Company's product candidates; the Company's ability to manufacture clinical trial materials on the timelines anticipated; and the success of future product advancements, including the success of future clinical trials. Further information on the factors and risks that could affect the Company's business, financial conditions and results of operations are contained in the Company's filings with the U.S. Securities and Exchange Commission, including under the heading "Risk Factors" in the Company's annual report on Form 10-K for the fiscal year ended December 31, 2021 and our other filings with the SEC, which are available at www.sec.gov.

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