Lipocine Announces Positive Topline Phase 2 Results from LPCN 1144 Ongoing LiFT Study in Biopsy-Confirmed NASH Subjects

Conference Call Scheduled for 8:30 a.m. ET today
-- Both LPCN 1144 treatment arms met the primary endpoint with statistical significance
-- Statistically significant reduction in liver fat was observed compared to placebo
-- -- Up to a mean of 9.2% absolute and 46.9% relative reduction in liver fat
-- Statistically significant reduction in markers of liver injury were observed compared to placebo
-- -- Up to a mean of 22.4 U/L decrease in alanine aminotransferase (ALT), and 10.4 U/L decrease in aspartate aminotransferase (AST)
-- Adverse events in both the treatment arms were comparable to the placebo arm

SALT LAKE CITY, Jan. 12, 2021 /PRNewswire/ -- Lipocine Inc. (NASDAQ: LPCN), a clinical-stage biopharmaceutical company focused on metabolic and endocrine disorders, today announced positive topline results from its *LiFT* ("***L***iver ***F***at intervention with oral ***T***estosterone") Phase 2 clinical study (NCT04134091), investigating LPCN 1144 in biopsy-confirmed non-cirrhotic non-alcoholic steatohepatitis ("NASH") male subjects. Currently, there are no approved treatments for NASH, a silent killer that affects ~30 million Americans. LPCN 1144 is an oral prodrug of endogenous testosterone.

In the ongoing randomized, double-blind, placebo-controlled 36-week treatment*LiFT* study, subjects with F1-F3 fibrosis were randomized 1:1:1 to one of three arms (Treatment A is a twice daily oral dose of 142 mg testosterone equivalent, Treatment B is a twice daily oral dose of 142 mg testosterone equivalent formulated with 217 mg of d-alpha tocopherol equivalent, and the third arm is twice daily matching placebo). The primary endpoint is change in hepatic fat fraction via Magnetic Resonance Imaging Proton Density Fat Fraction ("MRI-PDFF") and exploratory liver fat/marker end points post 12 weeks of treatment. Additionally, key secondary endpoints post 36 weeks of treatment include assessment of histological change for NASH resolution and/or fibrosis improvement as well as liver fat data.

Subjects will have access to LPCN 1144 through an open label extension study (NCT04685993). The extension study will enable the collection of additional data on LPCN 1144 for up to a total of 72 weeks of therapy

Treatments with LPCN 1144 post 12 weeks of treatment resulted in robust liver fat reduction, assessed by MRI-PDFF, and showed improvement of liver injury markers with no observed tolerability issues. Inclusion of d-alpha tocopherol formulated with the testosterone prodrug resulted in additional liver benefits, notably improved key liver markers without compromising tolerability.

Key results are presented in the following tables:

Table 1. Mean absolute liver fat using MRI-PDFF in all subjects (n=56)* at Week 12.

Treatment	**Change from baseline (CBL)**		**Placebo-adjusted CBL**	
	%	**p-value**	**%**	**p value**
A (n = 18)	-7.7	<0.0001	-6.1	0.0001
B (n = 19)	-9.2	<0.0001	-7.5	<0.0001
Placebo (n = 19)	-1.7	NS	n/a	n/a

* Missing data was obtained using Multiple Imputation
NS: Not significant (p > 0.05)

Table 2. Mean relative liver fat using MRI-PDFF at Week 12 in subjects (n=52) with liver fat ≥ 5% at baseline.*

Treatment	**Change from baseline (CBL)**		**Placebo-adjusted CBL**	
	%	**p value**	**%**	**p value**
A (n = 17)	-40.0	<0.0001	-30.0	0.0002
B (n = 17)	-46.9	<0.0001	-37.0	<0.0001
Placebo (n = 18)	-9.9	NS	n/a	n/a

* Based on available data.

Table 3. Responders with > 30% Relative Reduction in Liver Fat at Week 12, Intent to Treat Dataset (n=56)*.

Treatment	Responder (% of subjects)	p value vs Placebo
A (n = 18)	66.7	0.0058
B (n = 19)	63.2	0.0026
Placebo (n = 19)	15.8	

* Subjects with missing data are considered non-responders

Table 4. Average changes in key serum liver injury markers ALT and AST at Week 12 (n=52)*.

Treatment	ALT (U/L)				AST (U/L)			
	Absolute		Placebo-Adjusted Absolute		Absolute		Placebo-Adjusted Absolute	
	CBL	p value vs BL	CBL	p value vs Placebo	CBL	p value vs BL	CBL	p value vs Placebo
A (n = 16)	-9.4	0.0054	-11.1	0.0164	-4.9	0.0402	-7.7	0.0216
B (n = 19)	-22.4	<0.0001	-24.1	<0.0001	-10.4	<0.0001	-13.2	0.0001
Placebo (n = 17)	1.8	NS	n/a	n/a	2.8	NS	n/a	n/a

* All available data

During the 12 weeks of treatment, the observed rate and severity of Treatment Emergent Adverse Events ("TEAEs") in both the treatment arms were comparable to the placebo arm. Three subjects in the placebo group and one subject in the combined treatment arms discontinued study drug due to TEAEs.

"The *LiFT* study provides the first proof of concept that LPCN 1144 improves both liver fat and markers of liver injury in patients with biopsy proven NASH with fibrosis, with the majority of patients experiencing greater than 30% reduction in liver fat. The addition of d-alpha tocopherol appears to further reduce liver injury in this population. These data appear to support the potential for this novel approach as a treatment of NASH," said Dr. Arun Sanyal, Professor in the Virginia Commonwealth University ("VCU") Department of Internal Medicine and Education Core Director in the VCU Center for Clinical and Translational Research.

"We are pleased by the top-line results from our *LiFT* study, which we believe demonstrate the potential for oral LPCN 1144's to be used in treating NASH," said Dr. Mahesh Patel, Chairman, President and CEO of Lipocine Inc. "Additionally, NASH patients are likely to have compromised androgen signaling with associated sarcopenia, skeletal fragility, sexual/mood disorder, and anemia. Therefore, we believe LPCN 1144 therapy has the potential to provide additional benefits such as improved bone density and muscle mass as well as improvement in sexual/mental disorders. We look forward to sharing 36-week biopsy data from the *LiFT* study in mid-2021," said Dr. Patel.

Conference Call

Management will host a conference call and webcast today at8:30 a.m. Eastern time to discuss topline Phase 2 results from its LPCN 1144 ongoing *LiFT* study in biopsy-confirmed non-cirrhotic NASH subjects. To participate in the conference call, please dial 1-877-451-6152 from the U.S. or 1-201-389-0879 from outside the U.S. In addition, following the completion of the call, a telephone replay will be accessible until January 19, 2021, by dialing 1-844-512-2921 from the U.S. or 1-412-317-6671 from outside the U.S. and entering conference ID #13715019. Those interested in listening to the conference call live via the internet may do so by using the following link: http://public.viavid.com/index.php?id=143020. An archive of the webcast will also be available on the webcast page of the Company's website for 90 day.

About NASH

NASH is a more advanced state of non-alcoholic fatty liver disease ("NAFLD") and can progress to a cirrhotic liver and eventually hepatocellular carcinoma/liver cancer. Twenty to thirty percent of the U.S. population is estimated to suffer from NAFLD and fifteen to twenty percent of this group progress to NASH, which is a substantially large population that lacks effective therapy. Currently, there are no FDA approved treatments for NASH. Approximately 50% of NASH patients are in adult males and the number of NASH cases is projected to increase 63% from 16.5 million cases in 2015 to 27.0 million cases in 2030. NAFLD/NASH is becoming more common due to its strong correlation with obesity and metabolic syndrome, including components of metabolic syndrome such as diabetes, cardiovascular disease and high blood pressure. In men, especially with comorbidities associated with NAFLD/NASH, testosterone deficiency has been associated with an increased accumulation of visceral adipose tissue and insulin resistance, which could be factors contributing to NAFLD/NASH.

About Lipocine

Lipocine Inc. is a clinical-stage biopharmaceutical company focused on metabolic and endocrine disorders using its proprietary drug delivery technologies. Lipocine's clinical development pipeline includes: TLANDO, LPCN 1144, TLANDO XR, LPCN 1148 and LPCN 1107. TLANDO, a novel oral prodrug of testosterone containing testosterone undecanoate, has received tentative approval from the FDA for conditions associated with a deficiency of endogenous testosterone, also known as hypogonadism, in adult males. LPCN 1144, an oral prodrug of bioidentical testosterone, recently completed a proof-of-concept clinical study demonstrating the potential utility in the treatment of non-cirrhotic NASH. LPCN 1144 is currently being studied in a Phase 2 clinical study. TLANDO XR, a novel oral prodrug of testosterone, originated and is being developed by Lipocine as a next-generation oral testosterone product with potential for once-daily dosing. In a phase 2 clinical evaluation when administered as once daily or twice daily TLANDO XR met the typical primary and secondary end points. LPCN 1148 is an oral prodrug of bioidentical testosterone targeted for the treatment of cirrhosis. LPCN 1107 is potentially the first oral hydroxyprogesterone caproate product candidate indicated for the prevention of recurrent preterm birth and has been granted orphan drug designation by the FDA. For more information, please visit www.lipocine.com.

Cautionary and Forward-Looking Statements

This release contains "forward-looking statements" that are made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995 and include statements that are not historical facts regarding Lipocine's product candidates and related clinical trials, the timing of completion of clinical trials and studies, the availability of additional data, including week-36 data for the LiFT Phase 2 clinical study, outcomes of clinical trials of our product candidates, the potential uses and benefits of our product candidates, and our product development efforts. Investors are cautioned that all such forward-looking statements involve risks and uncertainties, including, without limitation, the risk that the FDA will not approve any of our products, risks related to our products, expected product benefits not being realized, clinical and regulatory expectations and plans not being realized, new regulatory developments and requirements, risks related to the FDA approval process including the receipt of regulatory approvals, the results and timing of clinical trials, patient acceptance of Lipocine's products, the manufacturing and commercialization of Lipocine's products, and other risks detailed in Lipocine's filings with the SEC, including, without limitation, its Form 10-K and other reports on Forms 8-K and 10-Q, all of which can be obtained on the SEC website at www.sec.gov. In addition, while we believe the top-line results from the*LiFT* study are positive, there can be no assurance at this stage that LPCN 1144 will provide the benefits indicated at this stage in the study, that later data will continue to support such benefits, or that the rate and severity of TEAEs will not change as the study continues. There can also be no assurance that we will choose, or have the ability, to conduct Phase 3 trials with respect to LPCN 1144 and, ultimately, apply for and receive approval from the FDA to market LPCN 1144 for the indications described in this press release. Lipocine assumes no obligation to update or revise publicly any forward-looking statements contained in this release, except as required by law.

SOURCE Lipocine Inc.

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