Idera Pharmaceuticals Presents Phase 1 Data on IMO-2125 Demonstrating Induction of Broad Antiviral Immune Response in Null-Responder HCV Patients

October 30, 2010 2:31 PM EDT

CAMBRIDGE, Mass., Oct 30, 2010 (BUSINESS WIRE) -- Idera Pharmaceuticals, Inc. (Nasdaq: IDRA) announced today the presentation of data from a Phase 1 clinical trial evaluating IMO-2125, a novel immune modulator, in null-responder patients with chronic hepatitis C virus (HCV) infection. The oral presentation, entitled "IMO-2125, a TLR9 Agonist, Induces Immune Responses which Correlate with Reductions in Viral Load in Null-Responder HCV Patients" (Abstract #33), is being made by Maribel Rodriguez-Torres, M.D., of Fundación de Investigación in Santurce, Puerto Rico at the 61st Annual Meeting of the American Association for the Study of Liver Diseases (AASLD).

"Null-responder patients are the most difficult HCV patients to treat and represent an area of significant need as there are currently no approved treatment options for these patients," said Dr. Rodriguez-Torres. "The data presented show that IMO-2125 induced a broad immune response including induction of endogenous interferons. This suggests that IMO-2125 may provide an alternative to the recombinant interferon component of HCV treatment."

This Phase 1 clinical trial evaluated 51 null-responder HCV patients; 41 patients received IMO-2125 monotherapy at five dose levels and 10 patients received placebo once per week for four weeks. Most of these patients were infected with HCV genotype 1 and had the CT or TT IL28B gene alleles. IMO-2125 was well tolerated at all dose levels. IMO-2125 induced a broad immune response with dose-dependent increases in serum concentrations of antiviral proteins and activation of cellular immune responses. Across the three highest dose levels, seventy-five percent of patients achieved a 1 $\log_{10}$ or greater decrease in viral load at least once during the treatment period. Consistent with the proposed mechanism of IMO-2125, induction of higher serum concentrations of interferon-alpha correlated with greater decreases in HCV viral load. Additional patients are being enrolled in this Phase 1 trial to evaluate twice-weekly dosing of IMO-2125.

"These data demonstrate that in the trial once-weekly dosing of IMO-2125 in null-responders induced a distinctive pattern of immune activation and achieved dose-dependent viral load reductions," said Robert Arbeit, M.D., VP of Clinical Development of Idera Pharmaceuticals. "To optimize the dosing schedule and maximize antiviral activity we are continuing the trial to evaluate twice-weekly dosing of IMO-2125."

Dr. Arbeit continued, "In addition, we are conducting a Phase 1 trial in treatment-naïve HCV patients evaluating IMO-2125 at multiple dose levels using both once-weekly and twice-weekly dosing regimens for four weeks in combination with ribavirin, compared to a control arm of patients receiving pegylated recombinant interferon-alpha and ribavirin. We expect to report top-line data from this trial in the fourth quarter."

"The data presented from this trial support the target product profile of IMO-2125 as a novel immune modulator with the potential to be used as a key component of HCV treatment," said Sudhir Agrawal, D.Phil., Chairman and Chief Executive Officer at Idera. "Prior to initiating a Phase 2 clinical trial for IMO-2125, we plan to analyze the full data sets from the ongoing Phase 1 IMO-2125 trials and evaluate the upcoming changes in the development and treatment landscape for HCV. We expect that, after assessing these factors, we will outline our clinical development strategy and plans for a Phase 2 program for IMO-2125 by the end of 2010."

Phase 1 Clinical Trial in Null-Responder HCV Patients

Study Design:

IMO-2125 was administered subcutaneously once per week for four weeks at five dose levels of 0.04, 0.08, 0.16, 0.32 and 0.48 mg/kg. The clinical trial was designed to evaluate safety, immunological activity and reduction in HCV viral load. Eight patients were enrolled at each dose level with an additional two patients randomized to receive placebo treatment for a total of 10 per cohort. All patients enrolled in the trial were null-responders, defined as patients who failed to achieve a 2 $\log_{10}$ reduction in viral load with 12 to 24 weeks of previous treatment with pegylated recombinant interferon-alpha plus ribavirin.

Study Results:

Patient Population

This Phase 1 clinical trial evaluated 51 null-responder HCV patients; 41 patients received IMO-2125 monotherapy and 10 patients received placebo. Patients were predominantly infected with HCV genotype 1 (98%) and over 90% were IL-28B genotypes CT or TT. At enrollment, the patients had high viral load (mean HCV RNA, 6.8 $\log_{10}$) and elevated levels of IP-10 (mean, 561 pg/mL). These factors are generally associated with poor response to standard of care treatment.

Safety

IMO-2125 was well tolerated for four weeks of treatment. There were no treatment-related serious adverse events (SAEs) and no treatment-related discontinuations. The most common adverse events were "flu-like symptoms" that typically lasted less than 1 day, injection site reactions and headache. There were no clinically significant adverse effects on safety laboratory parameters.

IMO-2125 Activation of Immune Response

- Patients receiving IMO-2125 showed dose-dependent increases in serum concentrations of endogenous interferon-alpha, which were more pronounced after the fourth dose compared to the first dose.

- Patients receiving IMO-2125 showed dose-dependent increases in serum concentrations of IP-10 and 2', 5'-oligoadenylate synthetase (2', 5'-OAS), host proteins which are known to contribute to antiviral activity.
- Patients receiving IMO-2125 showed dose-dependent increases in cell markers of immune activation, including increases in NK cells, helper T cells and cytotoxic T cells.

HCV RNA reduction

- Patients receiving IMO-2125 showed dose-dependent reduction in HCV RNA viral load.
- At dose levels of 0.32 and 0.48 mg/kg/week, six of eight patients and seven of eight patients, respectively, achieved a reduction in viral load of 1 $\log_{10}$ or more at least once during the treatment period; in both groups the median for the maximum viral load reductions was 1.6 $\log_{10}$.
- IL28B genotype data are available for 14 of the 16 patients treated with IMO-2125 at 0.32 or 0.48 mg/kg/week. Thirteen of these patients had CT or TT IL28B genotype, of which 10 had maximum viral load reductions ranging from -1 to -2.6 $\log_{10}$ at least once during the treatment period. The 14th patient had CC IL28B genotype and had a maximum viral load reduction of 2.5 $\log_{10}$ at least once during the treatment period.**
- Serum concentrations of endogenous interferon-alpha induced by IMO-2125 treatment correlated with reductions in HCV RNA viral levels.

** Updated information about the 14th patient indicated that this patient achieved a maximum viral load reduction of 3.5 $\log_{10}$ at least once during the treatment period (Presented at AASLD, October 31, 2010, in Parallel Session 4, 3:30 PM).

Dosage (mg/kg/wk)	N	Pts with greater-than or equal to 1 $\log_{10}$ decrease in HCV RNA	Median maximum $\log_{10}$ reduction in HCV RNA	Patients with IFN-a >25 pg/mL post-dose 1
Placebo	10	0/10	-0.3	1/10
0.04	8	0/8	-0.5	2/8
0.08	9	4/9	-1.0	3/9
0.16	8	5/8	-1.3	5/8
0.32	8	6/8	-1.6*	7/8
0.48	8	7/8	-1.6*	8/8

*p<0.001 compared to placebo

Authors of the presentation and study investigators include: Maribel Rodriguez-Torres, M.D., of Fundacion de Investigation, Santurce PR; Reem Ghalib, M.D., of The Liver Institute, Dallas TX; Stuart Gordon, M.D., of Henry Ford Medical Center, Novi, MI; Eric Lawitz, M.D., of Alamo Medical Research, San Antonio TX; Keyur Patel, M.D., of Duke University Medical Center, Durham NC; Ronald Pruitt, M.D., of Nashville Gastrointestinal Specialists, Nashville, TN; Aasim Sheikh, M.D., of Gastrointestinal Specialists of Georgia, Marietta GA; Andrew Muir, M.D., MHS, of Duke Clinical Research Institute, Durham, NC; John McHutchison, M.D., formerly of Duke Clinical Research Institute, Durham, NC; and Alice Bexon, MBChB, Ekambar Kandimalla, Ph.D., Melissa Precopio, Ph.D. and Tim Sullivan, Ph.D., of Idera Pharmaceuticals, Inc.

About IMO-2125

IMO-2125, a Toll-like Receptor (TLR) 9 agonist, is a novel immune modulator being developed as a component of treatment for chronic hepatitis C virus (HCV) infection. IMO-2125 is designed to stimulate the immune system, causing the body to generate natural interferons and other antiviral cytokines. IMO-2125 is currently in a Phase 1 clinical trial in null-responder HCV patients, defined as those who did not achieve a 2 $\log_{10}$ reduction with prior standard of care treatment, as monotherapy for 4 weeks. IMO-2125 is also being evaluated in a Phase 1 clinical trial in treatment-naïve HCV patients in combination with ribavirin for 4 weeks.

About Idera Pharmaceuticals, Inc.

Idera Pharmaceuticals develops drug candidates to treat infectious diseases, autoimmune and inflammatory diseases, cancer, and respiratory diseases, and for use as vaccine adjuvants. Our proprietary drug candidates are designed to modulate specific Toll-like Receptors (TLRs), which are a family of immune system receptors that direct immune system responses. Our pioneering DNA and RNA chemistry expertise enables us to create drug candidates for our internal development programs and our partnered programs, and generates opportunities for additional collaborative alliances. For more information, visit http://www.iderapharma.com/.

Idera Forward Looking Statements

This press release contains forward-looking statements concerning Idera Pharmaceuticals, Inc. that involve a number of risks and uncertainties. For this purpose, any statements contained herein that are not statements of historical fact may be deemed to be forward-looking statements. Without limiting the foregoing, the words "believes," "anticipates," "plans," "expects," "estimates," "intends," "should," "could," "will," "may," and similar expressions are intended to identify forward-looking statements. There are a number of important factors that could cause Idera's actual results to differ materially from those indicated by such forward-looking statements; whether results obtained in preclinical studies and early clinical trials such as

the trials referred to in this release will be indicative of results obtained in future clinical trials; whether products based on Idera's technology will advance into or through the clinical trial process on a timely basis or at all and receive approval from the United States Food and Drug Administration or equivalent foreign regulatory agencies; whether, if the Company's products receive approval, they will be successfully distributed and marketed; whether the Company's collaborations will be successful; whether the patents and patent applications owned or licensed by the Company will protect the Company's technology and prevent others from infringing it; whether Idera's cash resources will be sufficient to fund the Company's operations; and such other important factors as are set forth under the caption "Risk Factors" in Idera's Quarterly Report on Form 10-Q for the three months ended June 30, 2010, which important factors are incorporated herein by reference. Idera disclaims any intention or obligation to update any forward-looking statements.

SOURCE: Idera Pharmaceuticals, Inc.

Idera Pharmaceuticals, Inc.
Teri Dahlman, 617-679-5519
tdahlman@iderapharma.com
or
MacDougall Biomedical Communications
Chris Erdman, 781-235-3060
cerdman@macbiocom.com