June 3, 2019

Avenue Therapeutics Announces Positive Topline Data from Second Pivotal Phase 3 Study of Intravenous Tramadol in the Management of Postoperative Pain

Management to host a conference call today at 9 am EDT

NEW YORK, June 03, 2019 (GLOBE NEWSWIRE) -- Avenue Therapeutics, Inc. (NASDAQ: ATXI) ("Avenue"), a specialty pharmaceutical company focused on the development and commercialization of intravenous (IV) tramadol, today announced that its second pivotal Phase 3 trial of IV tramadol achieved the primary endpoint of a statistically significant improvement in Sum of Pain Intensity Difference over 24 hours (SPID24) compared to placebo in patients with postoperative pain following abdominoplasty surgery. In addition, the trial met all of its key secondary endpoints. The study also includes a standard-of-care IV opioid as an active comparator: IV morphine 4 mg. In this study, IV tramadol also demonstrated similar efficacy and safety to that of IV morphine.

"The strong safety and efficacy results from this second Phase 3 trial are consistent with those from the first Phase 3 trial in bunionectomy surgery and demonstrated the utility of IV tramadol in post-surgical pain management regardless of the surgery type," said Lucy Lu, M.D., Avenue's President and Chief Executive Officer. "This study is a significant milestone for Avenue because it brings us one step closer to submitting a New Drug Application (NDA) to the U.S. Food and Drug Administration (FDA), currently planned for year-end 2019."

"IV tramadol may fill a gap between non-opioid medicine and Schedule II opioids in the post-surgical setting and has the potential to provide a convenient bridge to the widely prescribed oral tramadol, a Schedule IV opioid," said Neil Singla, M.D., Chief Scientific Officer of Lotus Clinical Research and a thought leader of acute pain trials. "The results from the study demonstrated that IV tramadol is similarly potent to a conventional opioid in patients with post-surgical pain, and therefore, it could be a very important addition to the post-surgical pain armamentarium."

"We are pleased with these results," said Dr. Jaideep Gogtay, Chief Medical Officer at Cipla Limited and a board member of Avenue. "We look forward to working with Avenue in bringing a new and useful therapeutic option to U.S. patients suffering from acute pain."

Phase 3 Trial Design and Results

The Phase 3 multicenter, randomized, double-blind, placebo-controlled trial evaluated the efficacy and safety of IV tramadol in 370 patients following abdominoplasty surgery. Patients were randomized in a 3:3:2 ratio to a postoperative regimen of 50 mg of IV tramadol, placebo, or 4 mg of IV morphine at hours 0, 2, 4 and once every 4 hours thereafter,

respectively, for up to 13 doses over the course of 48 hours. Morphine, a standard-of-care analgesic, was included to obtain comparative safety data versus IV Tramadol.

The primary efficacy endpoint of the study assessed the analgesic efficacy of IV tramadol compared to placebo as measured by SPID24. The key secondary efficacy endpoints included Patient Global Assessment at 24 hours (PGA 24), SPID48, and total consumption of rescue medicine through 24 hours. A key safety objective of the study was to compare the safety and tolerability of IV tramadol to IV morphine.

IV tramadol 50 mg achieved the primary endpoint of statistically superior improvement in pain relief as measured by the SPID24 ($p<0.001$) compared to placebo, as well as met all three key secondary endpoints (each statistically significant at $p < 0.001$). IV tramadol and IV morphine demonstrated similar efficacy benefits in the study.

IV tramadol was well-tolerated with no drug-related serious adverse events in the trial. Most adverse events were mild or moderate (Grade 1 or 2) with only 2 patients experiencing a Grade 3 event (1 in the IV tramadol arm and 1 in the IV morphine arm). The most common adverse events (>10%) were:

	Nausea (%)		Vomiting (%)		Headache (%)		Dizziness (%)	
	As reported	Placebo-adjusted	As reported	Placebo-adjusted	As reported	Placebo-adjusted	As reported	Placebo-adjusted
Placebo	37.0		6.7		14.8		6.7	
IV tramadol	69.7	32.7	38.7	32.0	18.3	3.5	12.7	6.0
IV morphine	78.5	41.5	45.2	38.5	23.7	8.9	18.3	11.6

Study completion rates were high for all treatment groups (tramadol 87.9%, morphine 91.4%, placebo 93.4%).

Conference Call and Webcast

Avenue will host a conference call and webcast at 9:00 a.m. EDT today to discuss the topline Phase 3 data. To participate in the conference call, please dial (877) 273-6095 (domestic) or (647) 689-5538 (international) and enter the conference code: 6399686. A live audio webcast will be available on the Events page of the Investors section of Avenue's website at www.avenuetx.com. A replay of the audio webcast will be available approximately one hour after the call on the Events page of the Investors section of Avenue's website for a period of 30 days following the call.

About IV Tramadol

Tramadol is a synthetic, dual-acting opioid with a unique mechanism of action that delivers opioid efficacy with less potential for abuse and a lower risk of dependence than conventional narcotics. Oral tramadol has a well-established efficacy and safety profile, and is currently approved and marketed in the U.S. for moderate to moderately severe pain in adults. There is currently no approved IV formulation in the U.S.

About Avenue Therapeutics

Avenue is a specialty pharmaceutical company focused on the development and commercialization of IV tramadol for the management of moderate to moderately severe

post-operative pain. Avenue is headquartered in New York City and was founded by Fortress Biotech, Inc. (NASDAQ: FBIO). In November 2018, Avenue announced definitive agreements regarding an equity investment and contingent acquisition of Avenue by InvaGen, a subsidiary of Cipla Limited, a leading pharmaceutical company. The first stage of the transaction closed in February 2019. For more information, visit www.avenuetx.com.

Forward-Looking Statements

This press release may contain "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934, each as amended. Such statements include, but are not limited to, any statements relating to our growth strategy and product development programs and any other statements that are not historical facts. Forward-looking statements are based on management's current expectations and are subject to risks and uncertainties that could negatively affect our business, operating results, financial condition and stock value. Factors that could cause actual results to differ materially from those currently anticipated include: risks relating to our growth strategy; risks relating to the results of research and development activities; risks relating to the timing of starting and completing clinical trials; our ability to obtain, perform under and maintain financing and strategic agreements and relationships; uncertainties relating to preclinical and clinical testing; our dependence on third-party suppliers; our ability to attract, integrate and retain key personnel; the early stage of products under development; our need for substantial additional funds; government regulation; patent and intellectual property matters; competition; as well as other risks described in our SEC filings. We expressly disclaim any obligation or undertaking to release publicly any updates or revisions to any forward-looking statements contained herein to reflect any change in our expectations or any changes in events, conditions or circumstances on which any such statement is based, except as required by law.

Contacts:

Jaclyn Jaffe and William Begien, Investor Relations
Avenue Therapeutics, Inc.
(781) 652-4500
ir@avenuetx.com

Source: Avenue Therapeutics