Achaogen Highlights Multiple Plazomicin Presentations at IDWeek 2018

October 3, 2018

SOUTH SAN FRANCISCO, Calif., October 3, 2018 -- Achaogen, Inc. (NASDAQ: AKAO), a biopharmaceutical company discovering, developing, and commercializing innovative antibacterial agents to address multi-drug resistant (MDR) gram-negative infections, today highlighted one oral and five poster presentations about plazomicin that will be presented during the Infectious Diseases Society of America (IDSA) IDWeek™ 2018, held from October 3 to 7, 2018 in San Francisco, CA.

The presentations are summarized below:

Microbiological Outcomes with Plazomicin versus Colistin (CST) in Patients with Bloodstream Infections (BSI) Caused by Carbapenem-resistant Enterobacteriaceae (CRE) in the CARE Study, Serio et al. (Poster 1964, Saturday, October 6)
This analysis was performed to evaluate microbiological outcomes, including emergence of resistance, by pathogen and key resistance mechanisms in patients with CRE BSI in the CARE Study. The majority of patients with CRE BSI had isolates that harbored multiple mechanisms of resistance, including aminoglycoside modifying enzyme (AME) and carbapenemase genes. No emergence of resistance to plazomicin was observed in the study. The observed microbiological eradication rates at test-of-cure (day 5 to 9 after end of therapy) in the microbiological modified intent-to-treat population were higher in plazomicin-treated patients than in colistin-treated patients with BSI due to multidrug resistant Enterobacteriaceae, including AME-, extended spectrum beta lactamase-, and carbapenemase- producing organisms.

In Vitro Activity of Plazomicin, a Next-generation Aminoglycoside, against Carbapenemaseproducing Klebsiella pneumoniae, Jacobs et al. (Poster 1348, Friday, October 5)
The Consortium on Resistance Against Carbapenems in Klebsiella and other Enterobacteriaceae (CRACKLE) studied the in vitro activity of plazomicin against a collection of 697 carbapenem resistant Klebsiella pneumoniae, including isolates containing Klebsiella pneumoniae carbapenemase (KPC) and OXA carbapenemase, from 9 healthcare systems. Study results highlight the potency of plazomicin in vitro activity with a MIC90 (the lowest concentration of the antibiotic at which 90% of the isolates are inhibited) value of 1 mg/L and 97.6% of isolates susceptible when applying the U.S. FDA interpretive criteria of a minimum inhibitory concentration (MIC) ≤ 2 mg/L.

Mass Balance, Metabolism, and Excretion of Plazomicin in Healthy Human Subjects, Choi et al. (Poster 1400, Friday, October 5)
This study characterized the mass balance, excretion, and metabolism of [14C]-plazomicin following administration at the recommended clinical dose of 15 mg/kg in healthy subjects. Plazomicin was predominately eliminated renally.

Comparative Activity of Plazomicin and Other Aminoglycosides against Enterobacteriaceae (ENT) Isolates from Various Infection Sources from Hospitalized Patients in the United States, Castanheira et al. (Poster 1345, Friday, October 5)
The authors evaluated the activity of plazomicin and comparator antimicrobial agents, including amikacin and other aminoglycosides, against 8,510 ENT isolates that were collected in U.S. hospitals during 2014 to 2017 by site of infection. Study results included microbiologic activity against Carbapenem-resistant Enterobacteriaceae (CRE) isolates and isolates non susceptible to any 2 of amikacin, gentamicin, or tobramycin by applying the Clinical & Laboratory Standards Institute breakpoints. Study results showed activity of plazomicin against 97.0% of ENT isolates and did not vary by infection type (range, 94.3% to 98.5%). The study also showed variable amikacin, gentamicin, and tobramycin activity against CRE isolates ranging from <45% (tobramycin) to 69.2% (amikacin) while plazomicin remained active against 97.9% CRE isolates at the US FDA breakpoint.

Microbiological Outcomes with Plazomicin versus Colistin (CST) in Patients with Bloodstream Infections (BSI) Caused by Carbapenem-resistant Enterobacteriaceae (CRE) in the CARE Study, Serio et al. (Poster 1964, Saturday, October 6)
This analysis was performed to evaluate microbiological outcomes, including emergence of resistance, by pathogen and key resistance mechanisms in patients with CRE BSI in the CARE Study. The majority of patients with CRE BSI had isolates that harbored multiple mechanisms of resistance, including aminoglycoside modifying enzyme (AME) and carbapenemase genes. No emergence of resistance to plazomicin was observed in the study. The observed microbiological eradication rates at test-of-cure (day 5 to 9 after end of therapy) in the microbiological modified intent-to-treat population were higher in plazomicin-treated patients than in colistin-treated patients with BSI due to multidrug resistant Enterobacteriaceae, including AME-, extended spectrum beta lactamase-, and carbapenemase- producing organisms.

Comparison of Plazomicin MIC Test Strip and Broth Microdilution MIC Results for 125 Enterobacteriaceae, Koeth et al. (Poster 2060, Saturday, October 6)
This study was performed to evaluate the performance of the plazomicin MIC Test Strip (MTS) from Liofilchem, Waltham MA compared to the broth microdilution method against relevant Enterobacteriaceae. The study showed all plazomicin broth microdilution and MIC Test Strip results were within the Clinical & Laboratory Standards Institute (CLSI) expected quality control ranges. The data from this study formed the basis of submission to the FDA.

The posters and oral presentation slides will be available on the Achaogen website and additional information about the meeting is available on the IDWeek website.

About cUTI
cUTI is defined as a urinary tract infection occurring in a patient with an underlying complicating factor of the genitourinary tract, such as a structural or functional abnormality.1 Patients with pyelonephritis, regardless of underlying abnormalities of the urinary tract, are considered a subset of patients with cUTI.2 An estimated 3 million cases of cUTI are treated in the hospital setting in the U.S. each year.3 Enterobacteriaceae are the most common pathogens causing cUTIs4, and resistance within this family is a global concern. High rates of resistance to previous mainstays of therapy necessitate alternative treatment options. Ineffectively managed cUTI can lead to increased treatment failure rates, recurrence of infection, increased re-hospitalization, and increased morbidity and mortality. cUTI infections place an economic burden on hospitals and payers.

About ZEMDRI
ZEMDRITM (plazomicin) is an aminoglycoside administered as a once-daily, 30-minute intravenous (IV) infusion that has activity against certain Enterobacteriaceae. Achaogen's EPIC clinical trial successfully evaluated the safety and efficacy of ZEMDRI in adult patients with cUTI, including pyelonephritis. ZEMDRI was engineered to overcome aminoglycoside-modifying enzymes, the most common aminoglycoside-resistance mechanism in Enterobacteriaceae, and has in vitro activity against ESBL- producing, aminoglycoside- resistant, and carbapenem- resistant isolates. The Centers for Disease Control and Prevention (CDC) has characterized ESBL- producing Enterobacteriaceae as a "serious threat" and CRE as "nightmare bacteria" which is an immediate public health threat that requires urgent and aggressive action.

Indications & Usage
ZEMDRI is indicated in patients 18 years of age or older for the treatment of complicated urinary tract infections (cUTI), including pyelonephritis caused by the following susceptible microorganism(s): Escherichia coli, Klebsiella pneumoniae, Proteus mirabilis, and Enterobacter cloacae.

As only limited clinical safety and efficacy data for ZEMDRI are currently available, reserve ZEMDRI for use in cUTI patients who have limited or no alternative treatment options.

To reduce the development of drug-resistant bacteria and maintain effectiveness of ZEMDRI and other antibacterial drugs, ZEMDRI should be used only to treat or prevent infections that are proven or strongly suspected to be caused by susceptible microorganisms.

Important Safety Information

BOXED WARNINGS: NEPHROTOXICITY, OTOTOXICITY, NEUROMUSCULAR BLOCKADE AND FETAL HARM

- **Nephrotoxicity has been reported with ZEMDRI.** The risk of nephrotoxicity is greater in patients with impaired renal function, the elderly, and in those receiving concomitant nephrotoxic medications. Assess creatinine clearance in all patients prior to initiating therapy and daily during therapy. Therapeutic Drug Monitoring (TDM) is recommended for complicated urinary tract infection (cUTI) patients with CLcr less than 90 mL/min to avoid potentially toxic levels.
- **Ototoxicity, manifested as hearing loss, tinnitus, and/or vertigo, has been reported with ZEMDRI.** Symptoms of aminoglycoside-associated ototoxicity may be irreversible and may not become evident until after completion of therapy. Aminoglycoside-associated ototoxicity has been observed primarily in patients with a family history of hearing loss, patients with renal impairment, and in patients receiving higher doses and/or longer durations of therapy than recommended.
- **Aminoglycosides have been associated with neuromuscular blockade.** During therapy with ZEMDRI, monitor for adverse reactions associated with neuromuscular blockade particularly in high-risk patients, such as patients with underlying neuromuscular disorders (including myasthenia gravis) or in patients concomitantly receiving neuromuscular blocking agents.
- **Aminoglycosides, including ZEMDRI, can cause fetal harm when administered to a pregnant woman.**

Contraindications: ZEMDRI is contraindicated in patients with known hypersensitivity to any aminoglycoside.

Additional Warnings and Precautions

- **Nephrotoxicity:** Reported with the use of ZEMDRI. Most serum creatinine increases were ≤ 1 mg/dL above baseline and reversible. Assess CLcr in all patients prior to initiating therapy and daily during therapy with ZEMDRI, particularly in those at increased risk of nephrotoxicity, such as those with renal impairment, the elderly and those receiving concomitant potentially nephrotoxic medications. In the setting of worsening renal function, the benefit of continuing ZEMDRI should be assessed. Adjust the initial dosage regimen in cUTI patients with CLcr ≥ 15 mL/min and < 60 mL/min. For subsequent doses, TDM is recommended for patients with CLcr ≥ 15 mL/min and < 90 mL/min.
- **Ototoxicity:** Reported with ZEMDRI (manifested as hearing loss, tinnitus, and/or vertigo). Symptoms of aminoglycoside-associated ototoxicity may be irreversible and may not

become evident until after completion of therapy. Aminoglycoside-associated ototoxicity has been observed primarily in patients with a family history of hearing loss (excluding age-related hearing loss), patients with renal impairment, and in patients receiving higher doses and/or for longer periods than recommended. The benefit-risk of ZEMDRI therapy should be considered in these patients.

- **Neuromuscular Blockade:** Aminoglycosides have been associated with exacerbation of muscle weakness in patients with underlying neuromuscular disorders, or delay in recovery of neuromuscular function in patients receiving concomitant neuromuscular blocking agents. During therapy with ZEMDRI, monitor for adverse reactions associated with neuromuscular blockade, particularly in high-risk patients, such as patients with underlying neuromuscular disorders (including myasthenia gravis) or those patients concomitantly receiving neuromuscular blocking agents.
- **Fetal Harm:** Aminoglycosides, including ZEMDRI, can cause fetal harm when administered to a pregnant woman. Patients who use ZEMDRI during pregnancy or become pregnant while taking ZEMDRI should be apprised of the potential hazard to the fetus.
- **Hypersensitivity Reactions:** Serious and occasionally fatal hypersensitivity (anaphylactic) reactions have been reported in patients receiving aminoglycoside antibacterial drugs. Before therapy with ZEMDRI is instituted, careful inquiry about previous hypersensitivity reactions to other aminoglycosides should be made. Discontinue ZEMDRI if an allergic reaction occurs.
- **Clostridium difficile-Associated Diarrhea (CDAD):** Reported for nearly all systemic antibacterial drugs and may range in severity from mild diarrhea to fatal colitis. Treatment with antibacterial drugs alters the normal flora of the colon and may permit overgrowth of C. difficile. Careful medical history is necessary. If CDAD is suspected or confirmed, antibacterial drugs not directed against C. difficile may need to be discontinued.
- **Development of Drug-Resistant Bacteria:** Prescribing ZEMDRI in the absence of a proven or strongly suspected bacterial infection is unlikely to provide benefit to the patient and increases the risk of the development of drug-resistant bacteria.

The most common adverse reactions (≥ 1% of patients treated with ZEMDRI) are decreased renal function, diarrhea, hypertension, headache, nausea, vomiting and hypotension.

Please click here to see the full Prescribing Information, including BOXED WARNINGS, for additional Important Safety Information.

You may report side effects to the FDA at (800) FDA-1088 or www.fda.gov/medwatch. You may also report side effects to Achaogen at (833) AKAO-402.

About Achaogen

Achaogen is a biopharmaceutical company passionately committed to the discovery, development, and commercialization of innovative antibacterial treatments for MDR gramnegative infections. Achaogen's first commercial product is ZEMDRI, for the treatment of adults with complicated urinary tract infections, including pyelonephritis. The Achaogen ZEMDRI program was funded in part with federal funds from the Biomedical Advanced Research and Development Authority (BARDA). The Company is currently developing C-Scape, an orallyadministered beta-lactam/beta-lactamase inhibitor combination, which is also supported by BARDA. Achaogen is also developing a new aminoglycoside program, which is supported by CARBX. All product candidates are investigational, have not been determined to be safe or efficacious, and have not been approved for commercialization. For more information, visit the Achaogen website at www.achaogen.com.

Forward-Looking Statements

This press release contains forward-looking statements. All statements other than statements of historical facts contained herein are forward-looking statements reflecting the current beliefs and expectations of management made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995, including, but not limited to, the potential uses and advantages of ZEMDRI (plazomicin), Achaogen commercial objectives and the Achaogen pipeline of product candidates. Such forward-looking statements involve known and unknown risks, uncertainties, and other important factors that may cause Achaogen's actual results, performance, or achievements to be materially different from any future results, performance, or achievements expressed or implied by the forward-looking statements. For a further description of the risks and uncertainties that could cause actual results to differ from those expressed in these forwardlooking statements, as well as risks relating to the Achaogen business in general, see Achaogen current and future reports filed with the Securities and Exchange Commission, including its Annual

Report on Form 10-K filed on February 27, 2018, and its Quarterly Report on Form 10-Q filed on August 6, 2018. Achaogen does not plan to publicly update or revise any forward-looking statements contained in this press release, whether as a result of any new information, future events, changed circumstances, or otherwise.
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2U.S. Food & Drug. Complicated Urinary Tract Infections: Developing Drugs for Treatment Guidance for Industry. https://www.fda.gov/downloads/Drugs/Guidances/ucm070981.pdf. Accessed June 25, 2018.

3Decision Resources Disease Landscape & Forecast, Hospital-Treated Gram-Negative Infections, September 2017; data on file.

4Bader MS et al. Postgrad Med. 2010;122(6):7-15.

5Turner RM et al. Clin Ther. 2015;37(9):2037-2047.

Source: Achaogen, Inc.