July 16, 2012

Enzon Presents Pre-Clinical Data on Controlled Release of PEGylated Interferon-Beta-1b and PEGylated anti-TNF-a Antibody Fragment at the Controlled Release Society Annual Meeting

PISCATAWAY, NJ -- (Marketwire) -- 07/16/12 -- Enzon Pharmaceuticals, Inc. (NASDAQ: ENZN) today announced the presentation of data from pre-clinical studies on the controlled release of human interferon-beta-1b (IFN-β-1b) and an anti-TNF-α antibody fragment (Fab) through releasable PEGylation. The data were presented in a poster session (Poster #677) at the 39th Annual Meeting & Exposition of the Controlled Release Society in Québec City, Canada.

"Releasable PEGylation opens new opportunities to capture the inherent benefit of PEG technology, particularly with compounds that are not suitable for permanent PEGylation," said Dr. Hong Zhao, Senior Director of Chemistry at Enzon Pharmaceuticals. "This includes the possibility of creating extended release conjugates using well-characterized molecules, such as IFN-β-1b, without diminishing their therapeutic properties. Enzon remains a leader and the partner-of-choice in the development of both permanent and releasable PEG-drug conjugates, with technologies that are both clinically and commercially validated."

PEGylation, or bioconjugation of a therapeutic molecule with poly (ethylene glycol) polymers, is designed to improve the pharmaceutical properties of a drug molecule. Permanent bioconjugation, however, can diminish the pharmacological properties of the modified molecule, owing to an altered structure or function of the bioconjugate when compared to the native molecule. To address this, Enzon has developed the releasable PEGylation technology, wherein PEG polymers are shed via a controlled release mechanism to release the intact parent drug. Releasable PEGs may offer the greatest benefits to smaller molecules, peptides, antibody fragments and analogues of binding scaffold, which are inactivated by the bulky PEG partner, and may also benefit protein therapeutics such as toxins and signal transduction domains.

In the presented data, Enzon explored the modification of IFN-β-1b, a first-line therapy for relapsing-remitting multiple sclerosis, with both permanent and releasable PEGylation. IFN-β-1b clears rapidly following subcutaneous administration and has demonstrated substantial immunogenicity, including generation of neutralizing antibodies. Pharmacokinetic analysis of both permanent and releasable PEG-IFN-β-1b compounds in mice showed a 50-fold to 330-fold increase in area under the curve as compared to native IFN-β-1b, a result which addresses the exposure limitations of the native protein. The data support investigation of the efficacy and other pharmacodynamic properties of the releasable PEGylated conjugates of IFN-β-1b.

Enzon used an anti-TNF-α Fab as a model compound for assessing the benefits of releasable PEG. Anti-TNF-α therapies have utility in rheumatoid arthritis and other autoimmune diseases. In the in vitro binding and efficacy studies of releasable PEG-Fab conjugates, the released Fab had comparable binding affinity to TNF-α as analyzed by Biacore. Furthermore, the released Fab even at low concentrations showed comparable activity to native Fab in its ability to inhibit TNF-α-induced NF-kB cellular activity. In contrast, the permanent PEG-Fab had no anti TNF-α activity. The ability to maintain binding affinity and biological activity of released Fab provide an alternative approach to prolong the half-life of antibody fragments without reengineering the protein.

In order to apply permanent PEGylation to sensitive protein molecules, reengineering the parent protein to provide tags for PEG attachment away from functional domains is sometimes performed. In distinction, releasable PEG linkers can react with the primary amine of lysine residues without the need to modify the protein. The releasable PEG drug conjugate will have prolonged half-life compared to the parent drug, and its full biological activity can be realized after the intact drug molecule is released inside the body. Releasable PEG linkers can provide a practical option to improve the pharmaceutical properties of lead protein molecules without the need for reengineering.

About Enzon's Customized PEGylation Linker Technology

PEGylation has successfully been used on various pharmaceutical compounds, including enzymes, peptides and antibodies, to improve their pharmaceutical properties through the chemical attachment of polyethylene glycol (PEG) using our Customized Linker Technology. PEGylation technology employs proprietary chemical linkers designed to either release the native molecule at a controlled rate or provide permanent linkage that will maximize inherent activity of the parent molecule. In some cases, PEGylation can render a compound therapeutically effective, whereas the unmodified form had only limited clinical utility.

About Enzon

Enzon Pharmaceuticals, Inc. is a biotechnology company dedicated to the research and development of innovative

therapeutics for patients with high unmet medical need. Enzon's drug-development programs utilize two platforms: Customized PEGylation Linker Technology (Customized Linker Technology®) and third-generation mRNA-targeting agents utilizing the Locked Nucleic Acid (LNA) technology. Enzon currently has four compounds in human clinical development and multiple novel mRNA antagonists in preclinical research. Enzon receives royalty revenues from licensing arrangements with other companies related to sales of products developed using its proprietary Customized Linker Technology. Further information about Enzon and this press release can be found on the Company's website at www.enzon.com.

Forward-Looking Statements

This press release contains, or may contain, forward-looking statements within the "safe harbor" provisions of the Private Securities Litigation Reform Act of 1995. All statements contained in this press release, other than statements that are purely historical, are forward-looking statements, which can be identified by the use of forward-looking terminology such as the words "believes," "expects," "may," "will," "should," "potential," "anticipates," "plans," or "intends" and similar expressions. Forward-looking statements in this press release include, but are not limited to, statements regarding the potential of PEG-SN38.

Such forward-looking statements are based upon management's present expectations, objectives, anticipation, plans, hopes, beliefs, intentions or strategies regarding the future and are subject to known and unknown risks and uncertainties that could cause actual results, events or developments to be materially different from those indicated in such forward-looking statements, including but not limited to Enzon's reliance on third parties in conducting clinical trials for our product candidates. A more detailed discussion of these and other factors that could affect results is contained in Enzon's filings with the U.S. Securities and Exchange Commission, including Enzon's Annual Report on Form 10-K for the year ended December 31, 2011. These factors should be considered carefully and readers are cautioned not to place undue reliance on such forward-looking statements. No assurance can be given that the future results covered by the forward-looking statements will be achieved. All information in this press release is as of the date of this press release and Enzon does not intend to update this information.

Investor Contact:

Andrea Rabney

Argot Partners

212.600.1902

Email Contact

Media Contact:

Eliza Schleifstein

Argot Partners

212.600.1902

Email Contact

Source: Enzon Pharmaceuticals