April 24, 2017

Matinas BioPharma Presents Positive Preclinical Data of Orally Available DNA Vaccines at the 27th Annual European Congress of Clinical Microbiology and Infectious Diseases

Plasmid-Cochleate formulations show promise as commercially viable effective oral and systemic vaccines

BEDMINSTER, N.J., April 24, 2017 (GLOBE NEWSWIRE) -- Matinas BioPharma Holdings, Inc. (NYSE MKT:MTNB), a clinical-stage biopharmaceutical company focused on developing innovative anti-infectives for orphan indications, announced today that it presented positive preclinical data at the 27th Annual European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), being held April 22-25, 2017 in Vienna, Austria.

Raphael Mannino, Ph.D., Chief Scientific Officer of Matinas, presented the abstract (No. 6782) entitled, *"Efficacious and Commercially Viable DNA Vaccines: Plasmids Formulated into Lipid-Crystal Nano-Particles for Oral and Systemic Immunization,"* on Sunday, April 23, 2017 as a part of the "*Immunity and Immunogenetics of Infections"* session.

The use of DNA plasmids for protective and therapeutic vaccination continues to advance, however there still exists a need for safe, efficient and effective DNA vaccine formulations, and a delivery technology that is cost effective and commercially viable. This preclinical study evaluated Matinas' proprietary, disruptive technology, which utilizes lipid-crystal nano-particle cochleates to nano-encapsulate oligonucleotides, making them safer, more tolerable, less toxic and orally bioavailable, as a potential solution for DNA plasmid delivery.

This preclinical study evaluated the oral or intramuscular injection administration of encochleated formulations of plasmid pCMV HIV-1 containing 3.5μg or 17μg of DNA, given to BALB/c mice. Investigators observed that oral administration of two 3.5μg or 17μg doses yielded strong splenocyte cytolytic responses (73 to 85% specific lysis at an E:T ratio of 100:1) analogous to intramuscular injection. Oral administration of a higher dose (50μg) of naked DNA, was inactive. Low doses (3.5μg) of orally administered encochleated DNA induced antigen specific splenocyte proliferation 8-11 fold above background, similar to intramuscular. Naked plasmid was negative. In an additional preclinical study, mice were immunized intramuscularly with HSV-2 gD2 DNA, 25μg/dose, (pc DNA 3.1 vector backbone) and two IL12 plasmids (equal mixture of the p35 and p40 subunits), 35μg/dose. From this study, investigators observed that the encochleation of gD and IL-12 plasmids induced 2X greater HSV-specific cytolytic T cell responses than Herpes infection, as well as

enhancement of T helper 1 cellular responses and antibody. These studies affirmed that co-administration of cytokines can enhance the immunogenicity of a DNA-based vaccine. Naked DNA was inactive.

This preclinical research was led by Dr. Mannino and Ruying Lu of Matinas BioPharma.

Dr. Mannino commented, “Our cochleate technology has proven to be a uniquely stable, multilayered, essentially anhydrous lipid-crystal nano-particle that, following either oral or systemic delivery, safely and efficaciously delivers drugs and oligonucleotides to target tissues. The data from this study showed that cochleates successfully formulate and mediate *in vivo* delivery and efficacy of potential oligonucleotide based therapies, including DNA plasmids, and show promise as a commercially viable effective formulation for DNA vaccination and DNA plasmid delivery.”

About Matinas BioPharma

Matinas BioPharma is a clinical-stage biopharmaceutical company focused on developing innovative anti-infectives for orphan indications. The Company's proprietary, disruptive technology utilizes lipid-crystal nano-particle cochleates to nano-encapsulate existing drugs, making them safer, more tolerable, less toxic and orally bioavailable.

The Company's lead anti-infective product candidates, MAT2203 and MAT2501, position Matinas BioPharma to become a leader in the safe and effective delivery of anti-infective therapies utilizing its proprietary lipid-crystal nano-particle cochleate formulation technology. For more information, please visit www.matinasbiopharma.com and connect with the Company on Twitter, LinkedIn, Facebook, and Google+.

Forward Looking Statements: *This release contains "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995, including those relating to the Company's strategic focus and the future development of its product candidates, including MAT2203 and MAT2501, the anticipated timing of regulatory submissions, the anticipated timing of clinical studies, the Company’s ability to identify and pursue development and partnership opportunities for its products or platform delivery technology on favorable terms, if at all, and the ability to obtain required regulatory approval and other statements that are predictive in nature, that depend upon or refer to future events or conditions. All statements other than statements of historical fact are statements that could be forward-looking statements. Forward-looking statements include words such as "expects," "anticipates," "intends," "plans," "could," "believes," "estimates" and similar expressions. These statements involve known and unknown risks, uncertainties and other factors which may cause actual results to be materially different from any future results expressed or implied by the forward-looking statements. Forward-looking statements are subject to a number of risks and uncertainties, including, but not limited to, our ability to obtain additional capital to meet our liquidity needs on acceptable terms, or at all, including the additional capital which will be necessary to complete the clinical trials of our product candidates; our ability to successfully complete research and further development and commercialization of our product candidates; the uncertainties inherent in clinical testing; the timing, cost and uncertainty of obtaining regulatory approvals; our ability to maintain and derive benefit from the Qualified Infectious Disease Product (QIDP), Orphan and/or Fast Track designations for MAT2203 and MAT2501, which does not change the standards for regulatory approval or guarantee regulatory approval on an expedited basis, or at all; our*

ability to protect the Company's intellectual property; the loss of any executive officers or key personnel or consultants; competition; changes in the regulatory landscape or the imposition of regulations that affect the Company's products; and the other factors listed under "Risk Factors" in our filings with the SEC, including Forms 10-K, 10-Q and 8-K. Investors are cautioned not to place undue reliance on such forward-looking statements, which speak only as of the date of this release. Except as may be required by law, the Company does not undertake any obligation to release publicly any revisions to such forward-looking statements to reflect events or circumstances after the date hereof or to reflect the occurrence of unanticipated events. Matinas BioPharma's product candidates are all in a development stage and are not available for sale or use.

Investor Contact
Jenene Thomas
Jenene Thomas Communications, LLC
Phone: +1 (908) 938-1475
Email: jenene@jenenethomascommunications.com

Source: Matinas BioPharma Holdings, Inc.