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Preclinical Data Presented at American Association for Cancer Research (AACR) Annual Meeting Demonstrate Enhanced Therapeutic Benefit of Combining a PS-Targeting Antibody With Anti-PD-1 Therapy in Models of Triple Negative Breast Cancer (TNBC)

- Statistically Significant Improvement in Overall Survival for Combination as Compared to Anti-PD-1 Therapy Alone in TNBC Models; Combination Also Protects Against Re-Challenge With TNBC Tumor Cells -

- Novel Genetic Analysis Technology Further Validates Immune Modulating Mechanism of Bavituximab and Anti-PD-1 Combination; Supports Clinical Evaluation of Bavituximab and I-O Agent Combinations -

TUSTIN, Calif., April 20, 2016 (GLOBE NEWSWIRE) -- Peregrine Pharmaceuticals, Inc. (NASDAQ:PPHM) (NASDAQ:PPHMP), a biopharmaceutical company focused on developing therapeutics to stimulate the body's immune system to fight cancer, today announced the presentation of preclinical study data demonstrating enhanced anti-tumor activity and immune activation for a combination of the preclinical bavituximab equivalent (ch1N11) and anti-PD-1 therapy in models of breast cancer including triple negative breast cancer (TNBC). Additionally, new analysis conducted using the nCounter® PanCancer Immune Profiling Panel from NanoString Technologies® further validated previously reported findings showing that the combination treatment induced a shift in the tumor microenvironment from immunosuppressive to immune active. This was evidenced by a distinct change in immune cell phenotypes, as well as an increase in immune activating cytokines and decrease in immunosuppressive cytokines. These study results, which were presented at the 2016 American Association for Cancer Research (AACR) Annual Meeting, provide further support for Peregrine's strategy of evaluating bavituximab in combination with a range of novel immuno-oncology (I-O) agents for the treatment of various cancers.

"These presented study results, particularly the significant increase in overall survival and immunity to tumor re-challenge seen with the treatment combination as compared to anti-PD-1 therapy alone, continue to strengthen our collection of translational and preclinical data supporting the potential for bavituximab to enhance the therapeutic impact of I-O agents in the treatment of cancer. In doing so, these data provide further rationale for our clinical strategy focused on studying bavituximab in combination with I-O agents targeting the PD-1/PD-L1 pathway in a range of cancers," stated Jeff T. Hutchins, Ph.D., Peregrine's vice president, preclinical research. "With a wealth of supportive research in hand, we look forward to the continued advancement of our clinical collaborations with AstraZeneca, the National Comprehensive Cancer Network and Memorial Sloan Kettering Cancer Center, to further evaluate the therapeutic potential of bavituximab with novel I-O agent combinations."

Bavituximab is an investigational immunotherapy designed to assist the body's immune system by targeting and modulating the activity of phosphatidylserine (PS), a highly immune-suppressive signaling molecule expressed broadly on the surface of cells in the tumor microenvironment. Peregrine's PS signaling pathway inhibitor candidates, including bavituximab, reverse the immunosuppressive environment that many tumors establish in order to proliferate, while also activating immune cells that target and fight cancer. The preclinical equivalent of bavituximab, ch1N11, is used in animal model studies as a guide for clinical development.

As part of the study that was presented at AACR, researchers evaluated the combination of ch1N11 and anti-PD-1 therapy versus anti-PD-1 stand-alone therapy in two well-characterized murine models of TNBC (EMT-6 and E0771). Study data showed that the combination therapy significantly enhanced overall survival ($p=0.0155$) and was capable of mediating complete tumor regressions in a greater number of subjects compared to single agent treatments (60% vs. 20%). Data also demonstrated that animals receiving combination treatment had significant increases in tumor associated indicators of immune system activation, including CD45+, CD8+ and CD3+ T-cells. Importantly, the combination treatment led to a prolonged anti-tumor immune response which protected the animals that achieved a complete tumor regression against a re-challenge with the same E0771 TNBC model tumor cells. This sustained anti-tumor response demonstrates the ability of the combination treatment to trigger immune system memory and support adaptive immune responses against reemerging disease in this TNBC model. All study animals experienced no signs of adverse effects or weight loss following repeated doses of all therapeutic agents.

About Bavituximab: A Targeted Investigational Immunotherapy
Bavituximab is an investigational chimeric monoclonal antibody that targets phosphatidylserine (PS). Signals from PS inhibit the ability of immune cells to recognize and fight tumors. Bavituximab is believed to override PS mediated

immunosuppressive signaling by blocking the engagement of PS with its receptors as well as by sending an alternate immune activating signal. PS targeting antibodies have been shown to shift the functions of immune cells in tumors, resulting in multiple signs of immune activation and anti-tumor immune responses.

About Peregrine Pharmaceuticals, Inc.
Peregrine Pharmaceuticals, Inc. is a biopharmaceutical company developing therapeutics to stimulate the body's immune system to fight cancer. The company is focused on evaluating its lead immunotherapy candidate, bavituximab, in combination with a range of novel immuno-oncology (I-O) agents for the treatment of various cancers. One specific component of this I-O combination strategy includes a planned clinical trial of bavituximab in combination with durvalumab, AstraZeneca's investigational anti-PD-L1 immune checkpoint inhibitor, under a clinical collaboration.

In addition to its drug development programs, Peregrine also has in-house cGMP manufacturing capabilities through its wholly-owned subsidiary Avid Bioservices, Inc. (www.avidbio.com), which provides development and biomanufacturing services for both Peregrine and third-party customers. For more information, please visit www.peregrineinc.com.

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