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Preclinical Research Demonstrates Peregrine Pharmaceuticals' PS-Targeting Antibodies Enhance the Anti-Tumor Activity of PD-L1 Checkpoint Inhibitors in Model of Triple Negative Breast Cancer (TNBC)

-- Combination of PS-Targeting Antibody and Anti-PD-L1 Therapy, With or Without Chemotherapy, Led to Greater Anti-Tumor Activity Than Single Agent Treatment or Dual Combinations With Chemotherapy --

-- Additional Experiments Demonstrate that PS Expression is Upregulated on Cancer Cells Following Chemotherapy, Radiation or Photodynamic Therapy --

TUSTIN, Calif., Oct. 24, 2016 (GLOBE NEWSWIRE) -- Peregrine Pharmaceuticals, Inc. (NASDAQ:PPHM) (NASDAQ:PPHMP), a biopharmaceutical company committed to improving patient lives by manufacturing high quality products for biotechnology and pharmaceutical companies and advancing its proprietary R&D pipeline, today announced the presentation of preclinical study data demonstrating that phosphatidylserine (PS)-targeting antibodies similar to bavituximab are able to enhance the anti-tumor activity of anti-PD-L1 therapy in a model of triple negative breast cancer (TNBC). Data showed that a combination of anti-PS and anti-PD-L1 therapies, with or without paclitaxel, led to greater anti-tumor responses than any of the treatments administered as single agents or dual treatment combinations with paclitaxel, in the well-characterized E0771 murine model of TNBC. Study results were presented by researchers from Duke University Medical Center at the American Association for Cancer Research's Tumor Immunology and Immunotherapy Conference held October 20-23, 2016 in Boston, MA.

In addition to evaluating the anti-tumor activity of the various treatment combinations, researchers also examined the impact of various traditional cancer therapies on PS expression in cancer cells. Study results confirmed that levels of PS expression were upregulated in E0771 and 4T1 TNBC cells following treatment with chemotherapy, radiation or photodynamic therapy. Photodynamic therapy also was shown to increase PS expression on tumor cells.

"These study results provide the latest support for the belief that PS-targeting therapies can enhance the anti-tumor activity of checkpoint inhibitors such as anti-PD-L1 therapy in the treatment of TNBC. Just last month, we announced results from another preclinical study in TNBC demonstrating that 80% of animals receiving the triple combination of anti-PS, anti-PD-1 and anti-LAG3 therapies experienced complete tumor regressions, whereas there were no animals in the anti-PD-1 and anti-LAG3 combination treatment arm that had a complete regression," said Jeff T. Hutchins, Ph.D., Peregrine's vice president, preclinical research. "Additionally, these latest study findings related to increased PS expression on the surface of tumor cells following traditional cancer treatments demonstrate important activity within the tumor microenvironment that offers rationale for the potential of anti-PS agents in combatting cancer. We plan to continue to work with our collaborators at Duke University Medical Center to further study the therapeutic potential of PS-targeting agents in combination with checkpoint inhibitors like anti-PD-L1 and conventional therapies that augment immunotherapy mechanisms."

Bavituximab is an investigational monoclonal antibody that targets 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. Previous studies demonstrated PS-targeting antibodies shift the functions of immune cells in tumors, resulting in multiple signs of immune activation and anti-tumor responses. Peregrine evaluates the preclinical equivalent of bavituximab, ch1N11, in animal model studies to guide clinical development.

Peregrine's clinical development strategy for bavituximab currently focuses on small, early-stage, proof-of-concept trials evaluating the drug in combination with other cancer treatments. This approach includes the recently announced grants by the National Comprehensive Cancer Network (NCCN) to support three different clinical trials of bavituximab treatment combinations. Those trials will evaluate novel bavituximab combinations in glioblastoma, head and neck cancer, and hepatocellular carcinoma including an immunotherapy combination. Additionally, Peregrine continues to advance its pre-clinical collaboration with Memorial Sloan Kettering Cancer Center with the goal of evaluating combinations of bavituximab with other checkpoint inhibitors and immune stimulatory agents. The intent behind this strategy is to focus our research and development spending to further validate bavituximab's combination potential as we seek to advance the program though a pharmaceutical or biotechnology partner.

About Peregrine Pharmaceuticals, Inc.

Peregrine Pharmaceuticals, Inc. is a biopharmaceutical company committed to improving the lives of patients by delivering high quality pharmaceutical products through its contract development and manufacturing organization (CDMO) services and through advancing and licensing its investigational immunotherapy and related products. Peregrine's in-house CDMO services, including cGMP manufacturing and development capabilities, are provided through its wholly-owned subsidiary Avid Bioservices, Inc. (www.avidbio.com), which provides development and biomanufacturing services for both Peregrine and third-party customers. The company is also working to evaluate its lead immunotherapy candidate, bavituximab, in combination with immune stimulating therapies for the treatment of various cancers, and developing its proprietary exosome technology for the detection and monitoring of cancer. For more information, please visit www.peregrineinc.com.

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Contacts:

Stephanie Diaz (Investors)

Vida Strategic Partners

415-675-7401

sdiaz@vidasp.com

Tim Brons (Media)

Vida Strategic Partners

415-675-7402

tbrons@vidasp.com

Primary Logo

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