

## Researchers Report Peregrine's Phospholipid-Targeted Antibodies Fused With Cytokines Reduce Tumor Growth in Animals by Over 90%

- Data Demonstrates Potential of New Class of Targeted Fusion Therapies -

- Combines Peregrine's Proprietary Vascular Targeting Agent (VTA) and Anti-Phospholipid Technology Platforms -

TUSTIN, Calif., Sept. 19 /PRNewswire-FirstCall/ -- Peregrine Pharmaceuticals, Inc. (Nasdaq: PPHM), a biopharmaceutical company with a portfolio of innovative, clinical stage products for the treatment of cancer and hepatitis C virus (HCV) infection, today reported new research showing that a fusion protein approach that combines two proprietary Peregrine technology platforms -- its Vascular Targeting Agent (VTA) and anti- phospholipid (anti-PS) technologies -- has demonstrated significant anti-tumor potential. In a presentation at the Angiogenesis and Vascular Targeting Agents Conference, researchers presented data showing that a fusion protein combining an antibody from Peregrine's anti-phospholipid therapy program with immunostimulatory cytokines such as interferon or interleukin reduced tumor growth in animal cancer models by more than 90%, with no discernable increase in toxicity. These studies represent an important validation of a new class of compounds in Peregrine's proprietary VTA platform, which uses agents targeted to tumor blood vessels to kill tumors by depriving them of the nutrients and oxygen needed for continued growth.

"We have long thought that our anti-phospholipid platform would be ideal for the delivery of cytokines for cancer therapy, and the data presented today strongly supports the concept of using a cytokine fusion protein to 'supercharge' the ability of anti-phospholipid antibodies to stimulate the immune system," said Steven W. King, president and CEO of Peregrine. "The potential power of this approach is evident from the fact that our collaborators were able to reduce tumors in these animals by more than 90%, with no evidence of cytokine-induced toxicity. Based on this promising data and its good fit with our ongoing development efforts, we plan on working with our collaborators to conduct the studies needed to advance this technology toward human clinical studies."

In the research presented today by Dr. Xianming Huang, assistant professor of pharmacology at UT Southwestern Medical Center, interleukin 2 and interferon alpha proteins fused with an anti-phosphatidylserine monoclonal antibody were tested. The fusion proteins retained full antibody binding and cytokine activity, and combinations of the anti-PS antibody linked to the different cytokines had better anti-tumor effects than either agent alone, inhibiting tumor growth by over 90% in some B-cell lymphoma and melanoma tumor models.

"The anti-tumor efficacy of interferons in clinical trials has been limited by their very short half-life and significant systemic toxicity," said Dr. Huang. "To overcome these obstacles, we engineered immunocytokine fusion proteins combining an anti-PS antibody with various interferons. The resulting fusion proteins were able to target tumor blood vessels and displayed potent anti-cancer effects in tumor models without causing any observable toxicity. These studies demonstrate that this approach could have significant potential for targeted immunotherapy of solid tumors."

The new class of fusion protein agents falls under Peregrine's VTA technology platform that includes over 200 patents and patent applications covering broad concepts of tumor therapy using agents that target tumor blood vessels. Because interferon is currently part of standard-of-care therapy for hepatitis C virus infection, Peregrine also intends to assess the utility of the new class as a second-generation treatment for HCV infection.

Peregrine's lead anti-phospholipid agent bavituximab is currently being studied in Phase I clinical trials in the U.S. for the treatment of solid tumors and chronic hepatitis C infection. Clinical data collected to date have shown that bavituximab is safe and well tolerated, and the company has reported promising signs of anti-viral activity in the hepatitis C trial. A solid cancer trial in India combining bavituximab and chemotherapy regimens is expected to start shortly.

The presentation, "Targeting Inside-Out Phosphatidylserine (PS) on Tumor Vascular Endothelium," was presented today at 2:45 pm EDT by Dr. Xianming Huang of UT Southwestern Medical Center at the 4th Annual Angiogenesis and Vascular Targeting Agents Conference in Boston, MA.

**About Peregrine Pharmaceuticals** 

Peregrine Pharmaceuticals, Inc. is a biopharmaceutical company with a portfolio of innovative product candidates in clinical trials for the treatment of cancer and hepatitis C virus (HCV) infection. The company is pursuing three separate clinical trials in cancer and HCV infection with its lead product candidates bavituximab and Cotara®. Peregrine also has in-house manufacturing capabilities through its wholly owned subsidiary Avid Bioservices, Inc. (www.avidbio.com), which provides development and bio-manufacturing services for both Peregrine and outside customers. Additional information about Peregrine can be found at www.peregrineinc.com.

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