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Peregrine's Phosphatidylserine-Based Vascular Targeting Agent Technology Presented At Angiogenesis Conference

TUSTIN, Calif., Sept. 30 /PRNewswire/ -- Peregrine Pharmaceuticals (Nasdaq: PPHM) today presented pre-clinical data highlighting phosphatidylserine (PS) as a potential treatment for cancer. The talk, titled "Antibodies to Phospholipids as Vascular Targeting Agents for Cancer Treatment," was presented at the Angiogenesis: New Opportunities & Solutions for Drug Development conference in Cambridge, MA by Peregrine's President and CEO Steven King.

"We are pleased by this opportunity to present pre-clinical data related to our anti-PS antibody clinical candidate for use as a direct anti-cancer agent and as a potential targeting agent for our Vascular Targeting Agent (VTA) technology platform," said King. "We are very excited about the efficacy and safety data we have compiled in the unconjugated anti-PS pre-clinical development program. We also believe phosphatidylserine is an attractive target for our VTA platform and are currently evaluating the use of anti-PS antibodies to deliver therapeutics as VTAs. We look forward to continuing our pre-clinical research and making preparations to advance our lead anti-PS compound into human clinical studies in 2004."

The effect of anti-PS antibodies on tumor growth has been examined in various pre-clinical murine models. Treatment of mice with one of the antibodies resulted in 90%, 65%, 50% and 70% growth retardation of these tumors. Both small (0.1 cm diameter) and well-established (0.3 cm diameter) tumors were inhibited. Anti-PS treatment induced long-term complete remissions in 50% of mice with Meth A fibrosarcomas and 30% of mice with MBA-MD-231 breast tumors. The anti-PS antibodies have shown no toxicity in pre-clinical in vivo studies. The company believes that antibodies to PS and other anionic phospholipids have potential as therapeutic agents for targeting the vasculature of solid tumors.

"The creation of new tumor blood vessels in the adult, tumor-directed angiogenesis, is a multi-step process with significant redundancy at each step," said Dr. David Sherris, head of business development at Peregrine. "Blocking one of these steps using an anti-angiogenesis agent may have limited results due to the tumor's ability to continue the angiogenesis process through use of angiogenesis factor redundancy. This angiogenic pleiotropy can be considered a key limitation to the effectiveness of anti-angiogenesis agents in human clinical studies to date. One potential approach is to block several tumor angiogenesis factors simultaneously. Another approach is to completely circumvent the multi-angiogenesis factor problem by using vascular targeting agents, which aim to completely destroy the existing tumor blood vessel network in lieu of stopping the formation of new tumor blood vessels. Both anti-angiogenesis and vascular targeting approaches to the treatment of cancer fit very well with conventional anti-cancer therapy and should eventually become effective, mainstream treatments in the war against cancer."

About Phosphatidylserine

PS is an anionic phospholipid. The main function of phospholipids is the formation of cellular membranes. In normal cells, anionic phospholipids are on the inside of the cellular membrane. Exposure of anionic phospholipids on the cell surface occurs during apoptosis (normal cell death), necrosis, cell injury, cell activation and malignant transformation. Factors in the tumor microenvironment cause a breakdown of asymmetry and exposure of anionic phospholipids on the cell surface of the blood vessel and malignant cells.

Anionic phospholipids are attractive as tumor blood vessel targets for several reasons: they are abundant; they are on the surface of the endothelial cells that line tumor vessels that is accessible to VTAs in the blood; they are present on a significant percentage of endothelial cells in diverse solid tumors, and they appear to be absent from vascular endothelium in all normal tissues.

About Vascular Target Agents - The Next Generation of Cancer Therapy

Virtually all detectable tumors rely on a vascular network to obtain oxygen and nutrients, and disruption of this network can have a devastating effect on a tumor. In pre-clinical animal studies, VTAs have shown to be potent anti-cancer agents that act by cutting off the supply of oxygen and nutrients to tumor cells by causing blood clots to form within the tumor's blood supply network. VTAs localize within the tumor vasculature by selectively binding to the flat endothelial cells that line tumor blood vessels. Once the VTA binds to its target, it initiates thrombosis (blood clotting) through a coagulation cascade, which leads to complete clotting of the tumor blood vessels within a matter of minutes. Because blockage of a single capillary results in the destruction of thousands of tumor cells, only a small quantity of VTAs localized in the tumor's vascular system may cause an

avalanche of tumor cell death.

Vascular targeting agents offer several advantages as potentially powerful anti-cancer treatments. By targeting receptors unique to tumor cell vasculature, VTAs can kill tumors by cutting off oxygen and nutrients without causing damage to surrounding healthy tissue. Additionally, VTAs reduce the risk of potential side effects by operating at lower dosages than traditional cancer therapies because they do not need to penetrate the innermost layer of a tumor to take effect. Lastly, while drug resistance caused by the instability and mutability of cancer cells is a significant problem with conventional therapies that target tumor cells, cells targeted by VTAs do not mutate to become drug resistant.

About Peregrine Pharmaceuticals

Peregrine Pharmaceuticals is a biopharmaceutical company focused on the development, commercialization and licensing of unique technologies for the treatment of cancer, primarily based on three collateral targeting technologies. Peregrine's Tumor Necrosis Therapy (TNT), Vasopermeation Enhancement Agents (VEA), and Vascular Targeting Agents (VTA) technologies target cell structures and cell types that are common among solid tumor cancers, giving them broad applicability across various tumor types. The company has received approval from the FDA to start a Cotara™ Phase III clinical trial for brain cancer. Cotara is also being studied in a Phase I trial for colorectal, pancreas, soft tissue sarcoma and biliary cancers at Stanford University. The company is focused on licensing collaborations for all of its technologies under development. The company's Oncolym® technology to treat non-Hodgkin's B-cell lymphoma in Phase I/II of development is available for licensing. The company operates a cGMP contract manufacturing facility for monoclonal antibodies and recombinant proteins through its wholly owned subsidiary Avid Bioservices, Inc. (www.avidbio.com). Copies of Peregrine press releases, SEC filings, current price quotes and other valuable information for investors may be found on the website www.peregrineinc.com .

Safe Harbor Statement: This release may contain certain forward-looking statements that are made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. Actual events or results may differ from the company's expectations as a result of risk factors discussed in Peregrine's reports on file with the U.S. Securities and Exchange Commission, including, but not limited to, the company's report on Form 10-Q for the quarter ended July 31, 2003 and on Form 10-K for the year ended April 30, 2003.

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