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Data Presented at AACR Meeting Show Peregrine's Bavituximab Equivalent Can Generate Curative Immune Responses as Part of a Vaccine-Like Regimen in Preclinical Models of Aggressive Brain Cancer

- Immunization with a Bavituximab Equivalent and Irradiated Tumor Cells Increased Long-Term Survival to 57% From 0% in Controls in a Preclinical Model of Brain Cancer
- Survival Data Suggest that 99.99% of Tumor Cells in These Animals Were Destroyed
- Provides Proof of Concept that Peregrine's Anti-PS Antibodies can Reverse the Immune Response Inhibition Caused by Cancer

LOS ANGELES and TUSTIN, Calif., April 18 /PRNewswire-FirstCall/ -- Peregrine Pharmaceuticals, Inc. (Nasdaq: PPHM), a clinical stage biopharmaceutical company developing targeted monoclonal antibodies for the treatment of cancer and hepatitis C virus (HCV) infection, today announced preclinical studies presented at the Centennial Annual Meeting of the American Association for Cancer Research (AACR) showed that 2aG4, a mouse equivalent to the company's anti-phosphatidylserine (PS) antibody bavituximab has vaccine- like activity and can generate curative responses in an aggressive model of brain cancer. Researchers also presented data demonstrating that this improvement in survival was likely attributable to the ability of 2aG4 to enable the treated animals to mount an effective immune response against this difficult to treat cancer.

To confirm that the bavituximab equivalent 2aG4 acted by enhancing anti- cancer immune responses, researchers injected rats with irradiated glioma cells (inactivated tumor cells) along with 2aG4. This regimen was intended to protect the animals from a subsequent challenge with a large lethal dose of tumor cells -- 10,000 times the number required to produce lethal disease in this model.

Among the animals pre-treated with the 2aG4-treated irradiated cells, 57% achieved long-term survival, versus 0% of animals receiving no prior treatment ($P < 0.01$). The key role of the bavituximab equivalent's anti-PS activity in protecting these animals was illustrated by the fact that a group receiving irradiated control antibodies that did not block PS only achieved a 16% long-term survival rate.

These data are particularly noteworthy because the glioma cells used in the study are highly aggressive -- fewer than 10 cells can fuel development of a lethal tumor. In addition, the researchers calculated that in order to achieve the long-term survival observed in the animals receiving the 2aG4 regimen, more than 99.99% of the glioma cells contained in the challenge dose would have had to have been destroyed by the immune system. These results indicate that the 2aG4 vaccine-like regimen resulted in a strong immune response to the cancer not seen in controls.

"These exciting data suggest a potential new application for bavituximab and our anti-PS antibody platform as part of a cancer vaccine regimen that aims to restore the ability of the patient's own immune system to recognize and fight cancer," said Steven W. King, president and CEO of Peregrine. "Based on these promising results, we are continuing our evaluation of these vaccine-like regimens containing bavituximab for potential application to a variety of cancers."

Study data further showed that administering the combination of 2aG4 and irradiated tumor cells to the glioma cell-challenged animals resulted in a robust immune response, including enhanced cross-presentation of tumor antigens, increased expression of inflammatory anti-cancer cytokines and enhanced recognition and phagocytosis of tumor cells by macrophages. A key result was the fact that inclusion of the bavituximab equivalent in the regimen appeared to reverse suppression by tumor cells of the ability of dendritic cells to "present" cancer cells for destruction by the immune system. In these studies, the animals receiving 2aG4-treated irradiated cells showed increased antigen presentation of PS positive tumor cells by dendritic cells, as well as an increase in the number of cytotoxic T cells enabling the animals' immune systems to attack the tumor cells directly. These results are key signs of a strong immune response.

"We believe that a key mechanism of action of our anti-PS agents is that they block the immune-suppressing effects of phosphatidylserine in conditions such as cancer," said Dr. Philip Thorpe, professor of pharmacology at the University of Texas Southwestern Medical Center and a member of the Peregrine Scientific Resource Board. "These new studies in animal models of aggressive brain cancer are the strongest evidence yet that this is the case. We are eager to explore further the promising immune-enhancing activity demonstrated by our anti-PS antibody against this lethal cancer."

Bavituximab is a targeted monoclonal antibody that binds to a phospholipid called phosphatidylserine (PS), which is normally located on the inside of cells, but which becomes exposed on the outside of the cells that line the blood vessels of tumors. Once bound to tumor blood vessels, bavituximab alerts the body's immune system to attack the tumor's blood supply, stopping the flow of oxygen and nutrients to the tumor cells and resulting in tumor cell death. PS is also thought to play a role in suppressing the body's immune response to cancer. PS blockers may have the potential to help reverse this suppression and enable the immune system to attack the cancer more effectively. As an anti-cancer immunotherapeutic, bavituximab may have broad potential in a wide variety of solid cancers. It is currently in Phase Ia cancer safety trials as a monotherapy and in a Phase Ib trial in combination with docetaxel and other chemotherapy agents in patients with advanced solid cancers, including prostate, breast and lung cancer. Based on interim data, more than half of the cancer patients in this study who have completed treatment to date were assessed as demonstrating stable disease or an objective response.

This research was conducted under the direction of Dr. Thorpe and postdoctoral researcher Dr. Jin He at UT Southwestern Medical Center in Dallas.

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Number 4091: Enhancing the immunogenicity of glioma cells with anti- phosphatidylserine antibody, Jin He, Troy A. Luster, Philip E. Thorpe. UT Southwestern Medical Center, Dallas, TX, Apr 17, 2007, 8:00 AM - 12:00 PM EDT

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 programs for HCV infection and a range of solid cancers in the U.S. and India 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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Contacts:
GendeLLindheim BioCom Partners
Investors
info@peregrineinc.com
(800) 987-8256

Media
Barbara Lindheim
(212) 918-4650

SOURCE Peregrine Pharmaceuticals, Inc.

CONTACT:
Investors,GendeLLindheim BioCom Partners,
+1-800-987-8256,
info@peregrineinc.com,
or
Media, Barbara Lindheim of GendeLLindheim BioCom Partners,
+1-212-918-4650,
for Peregrine Pharmaceuticals, Inc.

Web site:
http://www.peregrineinc.com
http://www.avidbio.com