

## Progenics and Cytogen Develop Novel Prostate Cancer Vaccine with AlphaVax

Use of AlphaVax vaccine delivery system for cancer therapy generates powerful immune responses to prostate specific membrane antigen (PSMA) in preclinical studies – LakeTahoe, NV – September 6, 2001 –

The PSMA Development Company LLC, a joint venture of Progenics Pharmaceuticals, Inc. (Nasdaq: PGNX) and Cytogen Corporation (Nasdaq: CYTO), has entered into a worldwide exclusive licensing agreement with AlphaVax Human Vaccines, Inc., to use the AlphaVax Replicon Vector (ArV™) system to create a therapeutic prostate cancer vaccine incorporating the joint venture's proprietary PSMA antigen. The announcement follows an extensive preclinical evaluation of the ArV technology as a vaccine delivery and expression vehicle for prostate specific membrane antigen (PSMA), a well-recognized marker that is abundantly expressed on prostate cancer cells. Mice inoculated with the vaccine developed robust and specific immune responses to PSMA that persisted for prolonged periods. The scientific findings are scheduled to be presented this week at the Eighth Annual CaP CURE Scientific Retreat in Lake Tahoe, NV. The terms of the agreement with AlphaVax were not disclosed. "This collaboration with AlphaVax represents a new application of this powerful technology for prostate cancer therapy," said William C. Olson, Ph.D., Progenics' vice president of research and development and lead author of the presentation. "The potent and durable immune responses observed to date are encouraging indications of the potential for this vaccine to eliminate prostate cancer cells in man. We are completing our preclinical development activities on the PSMA ArV vaccine in anticipation of Phase I/II clinical studies in 2002." The PSMA-based therapeutic vaccine, which employs the body's own defense mechanisms to identify and destroy prostate cancer cells, yielded both antibodies and killer T cells, the two principal mechanisms used by the immune system to eliminate harmful cells. A subcutaneous injection of a genetically engineered, non-replicating viral vector containing the human DNA sequence that encodes a form of PSMA protein, generated high levels of PSMA-specific cytotoxic CD8+ killer T cells, helper CD4+ T cells and antibodies in mice. The broad cellular (killer T cell) and humoral (antibody) responses were long lasting, and are essential mechanisms for targeting and eliminating prostate cancer cells, which typically express PSMA on their surfaces. PROGENICS AND CYTOGEN DEVELOP PROSTATE CANCER VACCINE IN COLLABORATION WITH ALPHAVAX "Antigen-presenting cells are an important target for therapeutic cancer vaccines, because they alert the body to the presence of infectious agents and to cancers," said Howard I. Scher, M.D., chief, Genitourinary Oncology Service, Memorial Sloan-Kettering Cancer Center, New York City. "PSMA is a human protein that escapes the immune system. Vaccine Replicon Particles help to break this tolerance, to retrain the immune system to recognize PSMA as a danger signal, and to eliminate PSMA-expressing cancer cells." The core of the ArV system is an engineered, weakened form of Venezuelan Equine Encephalitis Virus (VEE). There-engineering process produces Vaccine Replicon Particles (VRPs) that encode PSMA but lack the viral genes required to make infectious virus. When VRPs infect a cell in the body, they direct the cell to churn out large amounts (as much as 20% of the total cellular protein) of the target antigen and thereby stimulate an immune response to the antigen. The VRPs are "non-replicating," i.e., they produce PSMA protein but differ from live viral vector systems in that the VRPs are incapable of producing (or making) infectious virus. This is an important safety feature of the vaccine. The vaccine targets antigen-presenting cell populations in the body and elicits both killer T cell and antibody responses. The advantages of the ArV system over other vaccine technologies include: • Natural targeting to the antigen-processing cells of the immune system • High antigen expression levels • Induction of strong humoral and cellular immune responses • Sustained potency over multiple simultaneous or sequential inoculations "We are pleased to enter into this agreement with the PSMA Development Company," said Peter F. Young, AlphaVax, Inc.'s president and chief executive officer. "By virtue of its ability to elicit high-level antibody and cellular immune responses to the target antigen, the ArV system offers great promise for the treatment of cancer, and we find the opportunity to work in this form of cancer therapy, paired with as important an antigen as PSMA, very exciting." PSMA is a cell-surface protein that is abundantly expressed on prostate cancer cells at all stages of disease, including advanced or metastatic disease. The PSMA gene was first discovered by scientists at Memorial Sloan-Kettering Cancer Center and is exclusively licensed to Cytogen Corporation, which has

sublicensed it to the PSMA Development Company for in vivo immunotherapy. The PSMA Development Company is developing a portfolio of therapeutic product candidates designed to target PSMA. In addition to the ArV vaccine, the PSMA Development Company is developing both PSMA monoclonal antibodies and a recombinant protein vaccine. The joint venture also plans to conduct clinical studies in which patients are "primed" with one type of PSMA vaccine and "boosted" with another in order to elicit an optimally protective and long-lived anti-tumor response. PSMA is also present at high levels on the newly formed blood vessels (neovasculature) needed for the growth and survival of many types of solid tumors. If PSMA-targeted therapies can destroy or prevent formation of these new blood vessels, the therapies may prove valuable in treating a broad range of cancers. "We are very encouraged by the powerful, long-lasting immune response generated by this PSMA-based prostate cancer vaccine. The agreement with AlphaVax represents a major advance in our ongoing efforts to provide a comprehensive range of options for prostate cancer patients based on PSMA technologies," said H. Joseph Reiser, Ph.D., president and chief executive officer, Cytogen Corporation. This press release contains forward-looking statements. Any statements contained herein that are not statements of historical fact may be forward-looking state. When Companies use the words 'anticipates,' 'plans,' 'expects' and similar expressions they are identifying forward-looking statement. Such forward-looking statements involve risks and uncertainties that may cause the companies' actual results, performance or achievements to be materially different from those expressed or implied by forward-looking statements. Such factors include, among others, the uncertainties associated with product development, the risk that clinical trials will not commence when or proceed as planned, the risks and uncertainties associated with dependence upon the actions of the companies; corporate, academic and other collaborators and of government regulatory agencies, the risk that products that appear promising in early clinical trials do not demonstrate efficacy in larger-scale clinical trials, the uncertainty of future profitability and other factors set forth more fully in the companies' Annual Reports on Form 10-K for the fiscal year ended December 31, 2000 and other periodic filings with the Securities and Exchange Commission to which investors are referred for further information. In particular, the companies cannot assure you that any of their programs will result in a commercial product. The companies do not have a policy of updating or revising forward-looking statements, and thus it should not be assumed that the companies' silence over time means that actual events are bearing out as expressed or implied in such forward-looking statements.