

Posted: February 5, 2008

Pro Pharmaceuticals Teams With UMass-Lowell On Target Drug Therapy

(Nanowerk News) The University of Massachusetts Lowell has allied with Pro Pharmaceuticals of Newton, Mass., in a research collaboration focused on target drug therapy in response to cancer.

The venture stems from the \$1 billion Life Sciences Initiative proposed by Governor Deval Patrick last May. The legislation outlined an effort to join the state's private industry and institutions in the advancement of scientific innovation and strengthening of the economy.

"We are working to respond to the Governor's \$1.2 billion initiative and ensure that the UMass System takes full advantage of the funding distributed," said Dr. Robert Nicolosi, Head of the Center for Health and Disease Research at Lowell.

The UMass system has made a concerted effort to establish itself as a formidable presence in the world of nano and microsystem technology. The New England Journal of Technology reported that part of the reason for the collaboration was UMass Lowell's expertise in nanotechnology. Nanotechnology deals with invention and innovation on a smaller scale.

"Collaborating with the University of Massachusetts Lowell represents an exciting opportunity to partner with a premier academic institution," said David Platt, Ph.D., Pro-Pharmaceuticals chairman and chief executive officer, this past December.

The collaboration will further research Pro Pharmaceuticals and lead product DAVANAT in conjunction with the common chemotherapy drug, Fluorouracil (5-FU). Agents like 5-FU are very close in composition to substances found in the cells.

After Fluorouracil is administered to cancer patients, through injection or dermal ointment, it enters cells and thwarts the replication of DNA. Incorporating antimetabolites like 5-FU into malignancies leaves cancerous cells unable to divide, according to the Cleveland Clinic Cancer Center.

However, 5-FU cannot differentiate between tumor cells and normal cells, causing increased toxicity in the body and a weakened immune system. Pro Pharmaceuticals hopes to decrease toxicity levels and optimize efficacy through target drug therapy. The compound DAVANAT shuttles agents Fluorouracil directly to the tumor. Nicolosi believes decreasing the size of the delivery system affords added benefit.

"A nano-delivery system makes the drug 10 to 20 times smaller than the traditional delivery system. It has increased solubility so fewer drugs are required and it can efficiently accumulate in the desired target," said Dr. Nicolosi.

According to Pro Pharmaceutical, the delivery system DAVANAT identifies cancerous masses due to an abundance of receptors, called galectins, on the masses. The company maintains that galectins are crucial in the survival and proliferation of cancer. Once the DAVANAT binds to galectins, 5-FU is released into the tumor. Because DAVANAT specifically binds to the tumor, there's no increased toxicity in normal cells.

Phase two of the research was released last week, preliminary results showed a mean improvement in the selected cohort. Twenty patients diagnosed with colorectal cancer were monitored in the study.

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