MedicalXpress

Researchers find clue to stopping breast-cancer metastasis

November 17 2008

If scientists knew exactly what a breast cancer cell needs to spread, then they could stop the most deadly part of the disease: metastasis. New research from the University of North Carolina at Chapel Hill School of Medicine takes a step in that direction.

Carol Otey, Ph.D. and UNC colleagues reduced the ability of breast cancer cells to migrate by knocking down the expression of a protein called palladin.

They also found higher levels of palladin in four invasive breast cancer cell lines compared to four non-invasive cell lines.

"This study shows that palladin may play an important role in the metastasis of breast cancer cells as they move out of the tumor and into the blood vessels and lymphatics to spread throughout the body," said Otey, associate professor of cell and molecular physiology.

To conduct the study, the researchers grew breast cancer cells in an "invasion chamber," in which human tumor cells are placed in a plastic well that is inserted into a larger well. Cells will attempt to move to the bottom of the chamber because it's baited with growth factors that cells find attractive. But first the cells have to migrate through a filter coated with a layer of artificial connective tissue. "The cells have to migrate through that and have to degrade it," Otey said. "It's a useful model system that mimics what happens in the body."

The study results appeared in the Nov. 3, 2008, online edition of the journal *Oncogene*.

Most women would never die from breast cancer if the cancer cells couldn't metastasize to the brain and bone marrow, Otey said. "To really make breast cancer a treatable disease, we have to be able to find a way to prevent or reduce the amount of metastasis."

"Now that we see palladin is expressed mostly in invasive cells, it raises the question as to whether it might be useful as a prognostic marker," Otey said. "Maybe someday doctors could test for the presence of palladin to identify patients who have the most aggressive tumors, then give those patients personalized, more aggressive treatment."

The study benefited from the collaboration between Otey's cell and molecular physiology lab and Dr. Hong Jin ("H.J.") Kim's surgical oncology lab. "I learned a lot from H.J. about the challenges that clinicians face as they try to optimize the treatment of each breast cancer patient," Otey said.

Otey has been investigating palladin's role in cell movement since she discovered and named it in 2000.

Next she will examine a variety of samples of human tumors from a UNC tumor bank, to find out if the tumors from patients who had worse outcomes and more aggressive cancers contain higher levels of palladin.

Source: University of North Carolina School of Medicine