Spread of cancer cells may be slowed by targeting of protein

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(Medical Xpress)—The spread of cancer cells may be slowed by targeting the protein km23-1, according to researchers at Penn State College of Medicine.

A motor protein that transports cargo within the cell, km23-1 is also involved in the movement or migration of cells. Migration is necessary for cancer to spread, so understanding this cell movement is important for development of better cancer treatments.

Kathleen Mulder, Ph.D., professor, biochemistry and molecular biology, looked for partner proteins that bind to and cooperate with km23-1 during cell movement, whichturned out to include factors that can control proteins actin and RhoA.

"Cell migration is an important aspect of the process of a tumor spreading," Mulder said. "Changes in this process transform tumor cells from local, noninvasive, confined cells to the migrating, metastatic cancer cells."

Cells move through the body using the protein actin, which forms the structural frame of the cell, called the cytoskeleton. The actin creates a protrusion in the cell membrane by forming strands of thread-like fibers on the leading edge of the cell, pushing the cell forward. Several identified proteins regulate the reorganization of the cytoskeleton and are more active in several types of cancers.

Overexpression of km23-1 increases actin fiber formation, whereas when km23-1 is diminished, RhoA activity decreases. RhoA is known to be an important switch, activating processes in migration.

"By knowing that RhoA activity was decreased when km23-1 was reduced, we infer that km23-1 is needed for the regulation of these switches and has a role in cell movement," Mulder said.

To test this in the lab, km23-1 was reduced in a sample of human colon cancer cells. When km23-1 was diminished, cancer cells migrated less. More research needs to be done, but km23-1 may be a promising target for anti-metastatic drugs and cancer therapies to slow the spread of the disease.

"By inhibiting km23-1, you inhibit events that contribute to the cells spreading to other parts of the body," Mulder said.

Results were reported in Biochemical and Biophysical Research Communications.

Other researchers are Qunyan Jin, Nageswara R. Pulipati, Cory M. Staub, of the Department of Biochemistry and Molecular Biology, Penn State College of Medicine; and Weidong Zhou and Lance A. Liotta, Center for Applied Proteomics and Molecular Medicine, George Mason University.

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