

Stopping cell migration may help block fibrosis and the spread of cancer

Yale UniversityYale University

Discoveries by a Yale-led team of scientists could lead the way for development of new therapies for treating fibrosis and tumor metastasis. The researchers have both uncovered a signaling pathway that promotes cell migration in certain forms of pulmonary fibrosis, a deadly lung disease, and developed a drug treatment that may block the cancer cell migration. The study appears in the Advance Online Publication of Nature Cell Biology.

Pulmonary fibrosis is the development of excessive connective tissue in the lungs. It can develop without a known cause, and produces permanent scar tissue in the lungs. There is no known cure or treatment to slow down its progress.

Cell migration is the biological process by which cells move around the body, often contributing to the development or spread of diseases such as fibrosis or metastatic cancer.

Fibroblast connective tissue cells and cancer cells migrate in a way that requires sustained activation of signaling pathways. But until now the regulation of these cellular functions has been poorly understood. The Yale team studied the workings of a stimulant of cell migration known as lysophosphatidic acid (LPA). They identified the chemical reactions that ultimately induce cell migration, but more importantly, discovered a way to block the pathway via inhibition of the proteins responsible for promoting the migration.

Senior author Dianqing (Dan) Wu, professor of pharmacology and vascular biology at Yale School of Medicine and member of Yale Cancer Center, explained, "Our ability to block the pathway provides a potential therapeutic target for treating pulmonary fibrosis, a very serious disease that lacks effective treatments, and other types of fibrosis. Because cancer cells, particularly melanoma and lung cancer cells containing activated BRAF genetic mutations, can use this signaling pathway to migrate, blocking this pathway could also prevent metastasis of these cancers."

Other authors are Xiaoqing Gan, Jiyong Wang and Chen Wang of Yale; Eeva Sommer and Dario Alessi of the University of Dundee; Tohru Kozasa of the University of Illinois at Chicago; Srinivasa Srinivasula of the National Cancer Institute; Stefan Offermanns of the Max-Planck-Institute for Heart and Lung Research; and Melvin I. Simon of the University of California at San Diego.

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