

Mesothelioma Research Update
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A recently published study* has revealed for the first time a connection between malignant **mesothelioma** and the overexpression of a particular genetic protein.

In an effort to better understand this particularly deadly form of cancer on a cellular level, a team from the University of California, San Francisco, Comprehensive Cancer Center sought to identify genetic material in mesothelioma cells that occurs at higher levels than the same material does in non-cancerous cells (that is overexpressed).

What the scientists discovered could be an important step in developing treatments that target mesothelioma cells in their earliest stages.

A strong and consistent clue

"In the biological sense, we don't know why mesothelioma develops or why it's so aggressive," says primary investigator Jae Kim, MD.

"Because the molecular pathways disrupted in this disease are so different from the ones disrupted in many other cancers, we must find mesothelioma's specific biologic mechanisms in order to come up with new targeted therapies."

Conducting gene-expression analyses enabled the team to identify patterns of genetic expression that are unique to mesothelioma cells, as well as the specific genes involved in the disease, Kim says.

The researches looked at nine mesothelioma cell lines (tumor cells that are cultured and manipulated so that they continue to divide) and eight tumor samples ("fresh" cells derived from mesothelioma tumors).

They discovered a gene that was consistently and strongly expressed in both the cell lines and the tumor samples: stathmin, a cellular protein previously implicated in other aggressive forms of cancer.

Stathmin was overexpressed in seven of the nine cell lines, and seven of the eight tumor samples.

"We were surprised that this occurrence was so prevalent throughout our study – and that the stathmin was so strongly and consistently overexpressed in both types of mesothelioma cells," says Kim, explaining that the protein is an important player in the life cycle of a cell.

"Stathmin's basic role is to regulate a cell's cytoskeleton, which controls the cell's architecture and instructs it to grow, develop, reproduce, and divide," he says. "Because cancer cells grow and divide much faster than normal cells do, the cytoskeleton link is critical – and many existing cancer drugs specifically target the cytoskeleton."

Interestingly, other studies have suggested that stathmin overexpression may cause cancer cells to become less sensitive to some types of chemotherapy, Kim says, "which could explain why mesothelioma often doesn't respond to these agents."

"We're Making Progress"

The group's findings could be valuable to the study and treatment of other types of cancer, as well, says Kim.

"Our data provide further evidence that stathmin is important in a variety of cancers – particularly the more aggressive ones – and it is definitely a target worth investigating further."

Kim's advice to mesothelioma patients and people at risk for the disease? Stay optimistic.

"The scientific community learns more about mesothelioma every day," he says. "We're discovering new molecular targets, and drugs are being developed to target different proteins and genes. We're making progress, and people with this disease should continue to have hope."

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