Gene found to play role in early cancer

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(Medical Xpress) -- Mutations to a gene called p53 have been linked to half of all cancers, leading to tumor growth and the spread of cancerous cells. Now, a Cornell-led study identifies for the first time the mechanisms by which p53 controls cell movement and invasion into other areas of the body.

Using cultures of ovarian surface epithelium cells, where ovarian cancer originates, the researchers found that when they inactivated the p53 gene , the cells began to move and invade the underlying gelatinous protein mixture used in the lab that resembles an extracellular tissue environment.

"People thought that cell motility and invasion were part of later stages of cancer, but we show that this characteristic can be found in cells at the very beginning of cancer formation," said Chang-Il Hwang, lead author of the paper recently published in the *Proceedings of the National Academy of Sciences* and a graduate student in the lab of Cornell biomedical sciences professor and senior author Alexander Nikitin.

Under normal circumstances, p53 regulates the expression of a receptor protein called MET. But when p53 mutates, MET overexpresses, leading to cell movement and invasive growth. The researchers found two distinct pathways by which p53 regulates and suppresses MET.

"One of the next steps is to study ways to inhibit MET," said Hwang. "Our findings support the idea that suppression of MET could be a particularly reasonable and effective approach to controlling cancer

carrying p53 mutations. We hope our findings can be generalized into other types of cancer as well."

In tests, the researchers found the p53 and MET network were consistent in both lung and colon cancer.

Mutations of p53 take many forms, with the most common mutation affecting one of the pathways that regulates MET but not the other pathway. By understanding how different p53 mutations affect each of the two pathways, researchers may one day develop individualized cancer therapies by suppressing MET, said Hwang.

"Different p53 mutations may affect the cancer from different angles," he added.

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Provided by Cornell University

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