

New switch found for turning off a tumor signal

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The discovery of new cellular machinery leading to tumor cell growth in colorectal cancers points to a possible treatment.

Researchers at the Life Sciences Institute at the University of Michigan report in a study published today (Sept 8) in the journal *Cell* that a signaling factor important in cell growth also may play a role in turning normal cells into tumors.

A team led by LSI research professor Kun-Liang Guan, assistant research scientist Ken Inoki, and U-M School of Dentistry assistant professor Hong-Jiao Ouyang discovered that two signaling factors—Wnt and mTOR—are both connected to how cells grow.

Cells communicate instructions by trafficking molecules along specific pathways. Some pathways inhibit cell growth and some stimulate cell growth. The mTOR signal encourages cell growth, and is normally held in check by another set of signaling proteins, but Guan's team now shows that the Wnt signal gets in the way of that control and gives the green light to mTOR's drive to cancerous tumor development.

Because the Wnt signal is known to be active in most colon cancers, the finding that it interacts with mTOR points to a possible therapeutic treatment for colon cancer with an FDA-approved drug, rapamycin, which inhibits the action of the mTOR pathway.

"The direct application from this research suggests that rapamycin could be a useful treatment for colon cancer because now we know that Wnt and mTOR are connected," Guan said.

Guan and his team have long studied the mTOR pathway, which processes information about cell status that regulates growth and proliferation. They have focused much of their work on a disease called tuberous sclerosis complex (TSC), which is

marked by numerous benign tumors that invade vital organs. They've found that TSC tumor suppressors inhibit the mTOR pathway.

The latest research shows that Wnt can inactivate the TSC1 and TSC2 complex, allowing mTOR to encourage cell growth and perhaps enhancing tumor development.

Source: University of Michigan

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