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Study finds cancer-fighting goodness in cholesterol

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A Simon Fraser University researcher is among four scientists who argue that cholesterol may slow or stop cancer cell growth. They describe how cholesterol-binding proteins called ORPs may control cell growth in A Detour for Yeast Oxysterol Binding Proteins, a paper published in the latest issue of the *Journal of Biological Chemistry.*

The scientists came to their conclusion while trying to understand how cholesterol moves around inside cells in the fat's journey to cell surfaces where it reinforces their outer membrane.

"The assumption was that ORPs bind and transport cholesterol inside cells in a similar fashion to how lipoproteins bind and move around the fat outside cells through the blood stream," explains Chris Beh. The SFU associate professor of molecular biology and biochemistry co-authored this paper.

Beh and his colleagues noted that genetic changes engineered by them block the ability of ORPs to bind cholesterol but don't stop ORPs from functioning. In fact, these altered ORPs work better and activate other regulator proteins, which in turn trigger a variety of cellular processes that stimulate cell growth.

The scientists believe this happened because cholesterol-binding normally interferes with ORPs' ability to bind to another lipid or fat called PI4P, which is important for cell growth.

"That told us that ORPs probably have nothing to do with moving around cholesterol within cells," says Beh. "Rather cholesterol-binding puts the brakes on ORP's ability to bind to PI4P which, if left unchecked, could accelerate cell growth like crazy," says Beh. "Given that uncontrolled cell growth is a key feature of cancer, this means gaining a better understanding of the true purpose of cholesterol-binding within cells could be important in cancer treatment."

Beh and his colleagues draw on two important facts to support their conclusion.

"First, cancer cells require ORPs to survive," explains Beh. "Second, other scientists have previously shown that a new class of natural compounds that look like steroids or cholesterol can kill a broad spectrum of different cancer cells."

Beh says he and his research partners will now find out exactly which proteins respond to ORP activation and under what circumstances does cholesterol turn off ORP's activation of them.

Provided by Simon Fraser University