

# Cholesterol helps regulate key signaling proteins in the cell

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Cholesterol plays a key role in regulating proteins involved in cell signaling and may be important to many other cell processes, an international team of researchers has found.

The results of their study are reported in the journal *Nature Communications*.

Cholesterol's role in heart disease has given it a bad reputation. But inside the [thin membrane](#) of a cell, the tight regulation of cholesterol at high levels (30 to 40 percent) suggests that it plays an important role in [cellular processes](#), says Wonhwa Cho, professor of chemistry at the University of Illinois at Chicago and principal investigator on the study.

Cho and colleagues had previously found evidence that cholesterol was directly interacting with many proteins found in the interior of the cell. The interaction seemed necessary for the proper functioning of these proteins.

"This was quite a surprising finding," said Cho, because cholesterol resides within the membrane, sandwiched between its inner and outer face. [Cell biologists](#) had thought it could only interact with other biomolecules within the membrane.

In the new study, Cho and his colleagues showed how cholesterol interacts with a [scaffolding protein](#), one of a class of proteins that plays an important role in cell signaling. The researchers showed that

cholesterol binds to a region on the [protein molecule](#) where one of its signaling partners also binds—and that disrupting cholesterol binding to the protein makes it unable to activate its partner.

The researchers describe in detail how the protein hooks onto and reaches inside the membrane to find and bind cholesterol.

Cho believes that this strategy for interacting with cholesterol may be used by many interior [cellular proteins](#) and offers an insight into what is known about the importance of cholesterol to well-functioning cells.

Much of the existing data on the cholesterol-related regulation of cellular processes had been difficult to interpret, he said.

"This is a major finding that will help people understand how cholesterol may regulate other cellular processes," Cho said.

Provided by University of Illinois at Chicago

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