

## Why belly fat isn't all bad: Fatty membrane helps regulate immune system

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A fatty membrane in the belly called the omentum has until recently been considered somewhat like the appendix -- it didn't seem to serve much purpose.

But Loyola University Chicago Stritch School of Medicine researchers have found that the [omentum](#) appears to play an important role in regulating the immune system. The finding could lead to [new drugs](#) for organ transplant patients and patients with auto-immune diseases such as lupus and Crohn's disease.

"We now have evidence that the omentum is not just fat sitting in the belly," said Makio Iwashima, PhD, corresponding author of a study published in the June 6 issue of [PLoS ONE](#). Iwashima is an associate professor in the Department of Microbiology and Immunology.

The omentum is a membrane that lines the [abdominal cavity](#) and covers most [abdominal organs](#). It is a repository for fat tissue.

A research team headed by Iwashima and Robert Love, MD, a world renowned lung transplant surgeon, examined the effect that mouse omentum cells had on [T lymphocyte](#) cells from a mouse. T cells are the immune system's first line of defense against infection. They identify, attack and destroy bacteria, viruses and other infectious agents.

Normally, T cells multiply in response to an [infectious agent](#), such as an antibody. But when researchers put omentum cells in with activated T

cells that had been exposed to antibodies, the T cells did not multiply as they normally would, but instead died. The omentum cells had this effect only on T cells that had been activated. Omentum cells did not have any effect on inactive [T cells](#).

It appears that omentum cells secrete a substance that tamps down the immune system. This discovery could lead to new drugs that would suppress the immune system with fewer side effects than those caused by immune-suppressing drugs now in use. Such drugs could be used, for example, to suppress the immune system in a patient who has received a lung transplant.

In addition to modulating the immune system, the omentum also appears to play a critical role in regenerating damaged tissues, Iwashima said. The omentum contains mesenchymal stem cells that migrate to the site of an injury and help regenerate tissue. Mesenchymal stem cells are cells that have the ability to develop into various types of specialized cells.

In this study, researchers showed that, in tissue-culture flasks, omentum cells can differentiate into lung-type cells as well as bone cells. Iwashima believes the omentum may be the organ specified for tissue healing and regeneration.

**More information:** <http://dx.plos.org/10.1371/journal.pone.0038368>

Provided by Loyola University Health System

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