

# Get to know the omentum: The apron of fat that protects your abdomen

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The quirkiest organ in the human body may be a large sheet of fat that stretches over the intestines, liver, and stomach like an elastic apron. Sometimes called the "policeman of the abdomen," the omentum is known to secrete hormones related to obesity, and we're still learning new information about its functions. In a review published June 1 in *Trends in Immunology*, researchers discuss how the omentum is also an important immune organ that serves as a first line of defense against toxins and infection—hardly what you'd expect from a layer of fat.

The omentum's [immune functions](#) come from groups of small, white filters located among the [fat cells](#). Anatomists first discovered these cell clusters in rabbits around 1874, giving them the name milky spots. Recent research has shown that they aid the omentum by collecting information about the health of the [abdominal cavity](#). While the size and shape of the omentum varies, milky spots speckle the entire tissue and serve as a filter for surrounding fluid.

"The fluid around the [abdominal organs](#) doesn't just sit there, it circulates through the milky spots," says Troy D. Randall, a clinical immunologist at the University of Alabama at Birmingham, who co-wrote the review with postdoctoral fellow Selene Meza-Perez. "Milky spots collect cells, antigens, and bacteria before deciding what's going to happen immunologically."

The milky spots' analyses cause the omentum to respond immunologically by releasing inflammatory molecules, tolerating the

presence of an antigen, or beginning the process of fibrosis. Humans develop milky spots in their omentum during early development, before bacteria even appears, indicating its role as a primary immune organ.

Unfortunately, even protective organs make mistakes. "In concerns to tumor cells, the omentum makes the wrong decision," Randall says. "It decides to provide tolerance instead of immunity." While tumors of the [omentum](#) are uncommon, the circulating fluids bring back cancer cells into the milky spots, where they get trapped like grass in a pool filter, promoting metastasis. It is a breeding ground for aggressive tumors such as in ovarian and gastrointestinal cancer.

Scientists hope to target these sites of tumor growth with therapies that can control abdominal tumors and assist anti-tumor immunity. "If we can figure this out, then we can start really making inroads on cancer treatments because, in most cases, you don't even catch ovarian cancer until it metastasizes," Randall says. "Understanding how cancer changes the immune system will lead us directly to ways to intervene and, hopefully, start to turn things around."

**More information:** *Trends in Immunology*, Meza-Perez and Randall: "Immunological functions of the omentum" [www.cell.com/trends/immunology ... 1471-4906\(17\)30052-2](http://www.cell.com/trends/immunology...1471-4906(17)30052-2) , DOI: [10.1016/j.it.2017.03.002](https://doi.org/10.1016/j.it.2017.03.002)

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