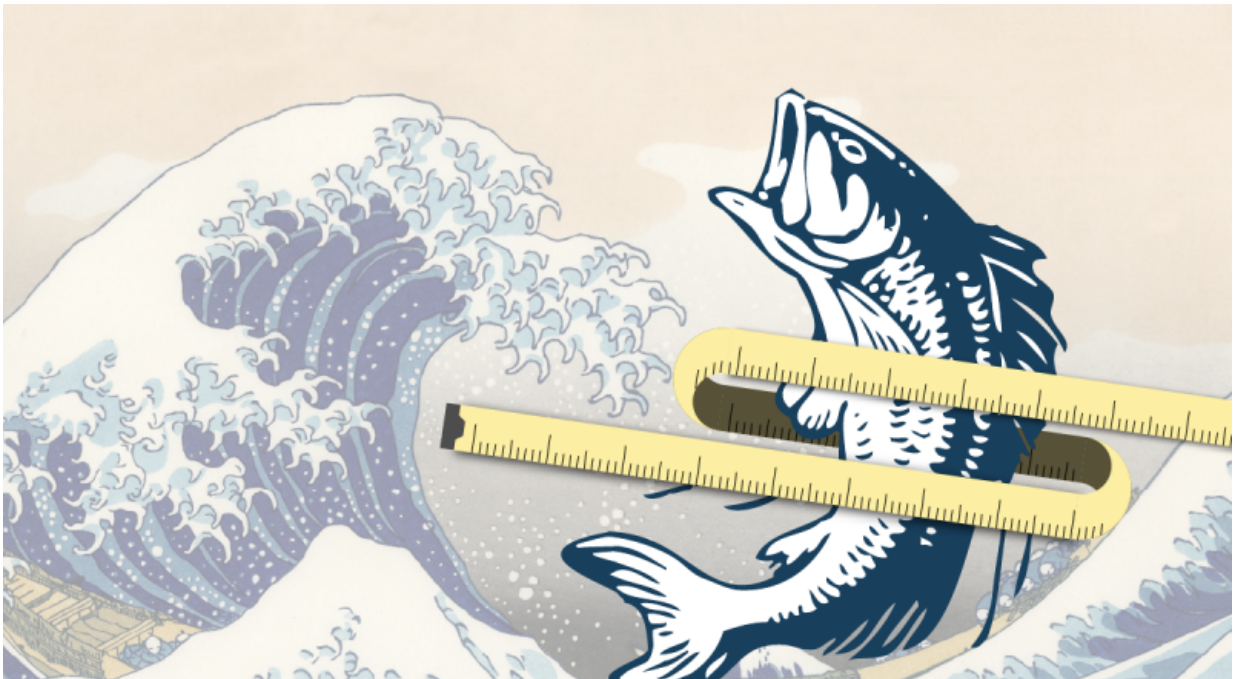


# Fish oil helps transform fat cells from storage to burning

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Kyoto University researchers have found that fish oil transforms fat-storage cells into fat-burning cells, which may reduce weight gain in middle age. Fish oil activates receptors in the digestive tract, fires the sympathetic nervous system, and induces storage cells to metabolize fat. Credit: Eiri Ono/Kyoto University

Researchers have found that fish oil transforms fat-storage cells into fat-burning cells, which may reduce weight gain in middle age.

The team explains in *Scientific Reports* that [fish oil](#) activates receptors in the digestive tract, fires the sympathetic nervous system, and induces storage cells to metabolize fat.

Fat tissues don't all store fat. So-called "white" cells store fat in order to maintain energy supply, while "brown" cells metabolize fat to maintain a stable body temperature. Brown cells are abundant in babies but decrease in number with maturity into adulthood.

A third type of fat cell—"beige" cells—have recently been found in humans and mice, and have shown to function much like brown cells. Beige cells also reduce in number as people approach [middle age](#); without these metabolizing cells, fat continues accumulating for decades without ever being used.

The scientists investigated whether the number of these beige cells could be increased by taking in certain types of foods.

"We knew from previous research that fish oil has tremendous health benefits, including the prevention of fat accumulation," says senior author Teruo Kawada. "We tested whether fish oil and an increase in beige cells could be related."

The team fed a group of mice fatty food, and other groups fatty food with fish oil additives. The mice that ate food with fish oil, they found, gained 5-10% less weight and 15-25% less fat compared to those that did not consume the oil.

They also found that beige cells formed from white fat cells when the sympathetic nervous system was activated, meaning that certain [fat](#)-storage [cells](#) acquired the ability to metabolize.

"People have long said that food from Japan and the Mediterranean

contribute to longevity, but why these cuisines are beneficial was up for debate," adds Kawada. "Now we have better insight into why that may be."

**More information:** Minji Kim et al. Fish oil intake induces UCP1 upregulation in brown and white adipose tissue via the sympathetic nervous system, *Scientific Reports* (2015). [DOI: 10.1038/srep18013](https://doi.org/10.1038/srep18013)

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