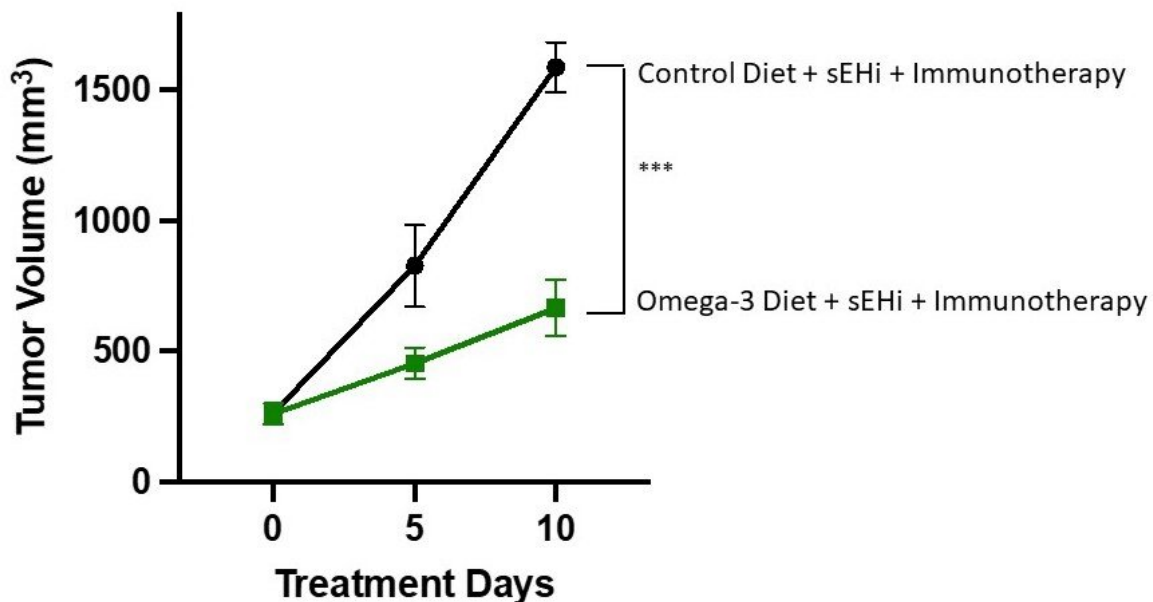


# Omega-3s could boost immunotherapy's cancer-fighting power

April 1 2022



Omega-3 supplementation improves the efficacy of immunotherapy in subcutaneous murine MB49 bladder cancer tumors. Credit: Abigail Kelly, Beth Israel Deaconess Medical Center/Harvard Medical School

Findings from a new study performed in mice suggest that omega-3 fatty acids could help immunotherapy and other treatments do a better job at

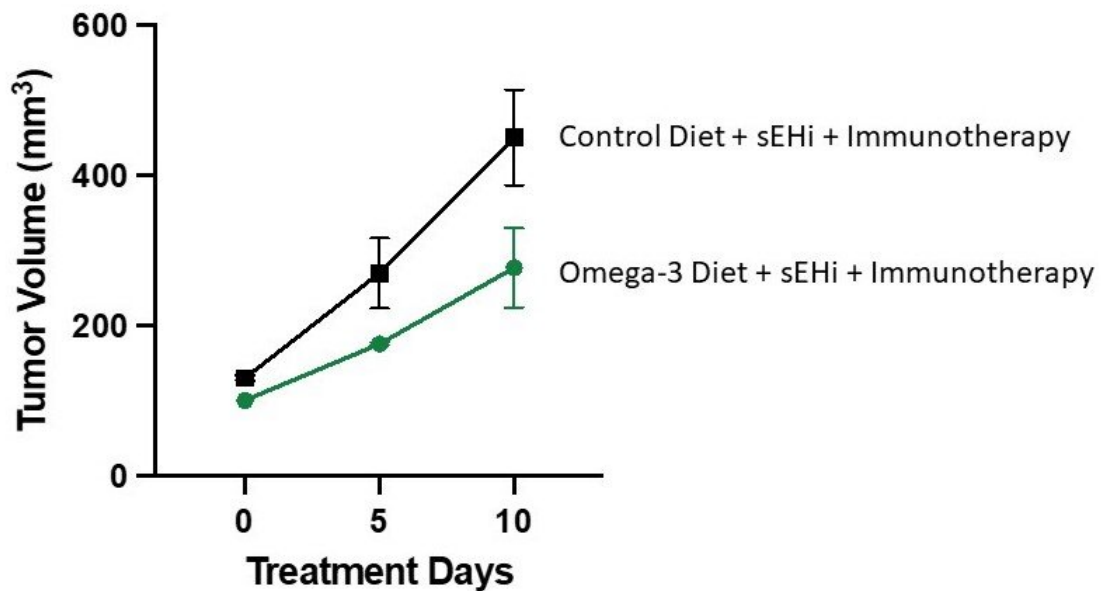
fighting cancer. Immunotherapies, which stimulate the body's own immune system to attack cancer, have revolutionized cancer treatment, but they don't work for every patient.

"Dietary interventions can be powerful tools because they are relatively simple and inexpensive to implement," said Abigail Kelly, a research assistant at Harvard Medical School's Beth Israel Deaconess Medical Center in Boston. "Our findings show that omega-3 supplementation has the potential to broadly improve immunotherapy and other [anti-cancer drugs](#) in the clinical setting."

Kelly will present the new research at the American Society for Investigative Pathology annual meeting during the Experimental Biology (EB) 2022 meeting, to be held April 2–5 in Philadelphia.

Research from various laboratories has suggested that omega-3 fatty acids can help reduce [cancer risk](#) whereas consuming too much omega-6 fatty acids can stimulate cancer. Sources of omega-3s include fish, nuts and seeds while omegas-6s are found in meats, eggs and other foods.

In the new studies, Kelly and senior author Dipak Panigraphy wanted to find out how diets supplemented with these [fatty acids](#) affected the anti-tumor activity of immune checkpoint blockade immunotherapy and an anti-inflammatory therapy that inhibits the enzyme soluble epoxide hydrolase (sEH). The immunotherapy has regulatory approval and is being used clinically while the anti-inflammatory therapy is undergoing clinical development.



Omega-3 supplementation in combination with inhibition of sEH improves the efficacy of immunotherapy in subcutaneous murine Lewis Lung Carcinoma tumors. Credit: Abigail Kelly, Beth Israel Deaconess Medical Center/Harvard Medical School

The researchers used state-of-the-art mouse models of primary and [metastatic tumors](#) for the new study. They began by feeding the mice either a standard diet or a diet high in omega-3 or 6 for 10 days prior to tumor injection and for the duration of the studies. One week after the tumors were injected, mice in each diet group were started on immunotherapy, anti-inflammatory therapy, both therapies together, or no treatment.

The researchers found that dietary omega-3 fatty acid supplementation

blocked tumor growth in mice treated with immunotherapy, sEH inhibitor, or both treatments used together. In contrast, mice on the high-omega-6 diet and given immunotherapy experienced accelerated tumor growth in certain tumor types.

In mice receiving the high omega-3 diet and both cancer treatments, up to 67 percent of [tumor growth](#) was inhibited compared to mice receiving no treatment and a normal [diet](#). This indicates possible synergistic anti-tumor activity, meaning that the combined effect may be greater than the sum of its parts.

"We demonstrated, for the first time, that the combination of immunotherapy and anti-inflammatory treatment (sEHi) was more effective when mice were fed diets enriched with [omega-3 fatty acids](#)," said Kelly. "This is very promising because dietary supplementation is easy to implement for cancer patients and can be added for patients already on [immunotherapy](#)."

The researchers are now performing additional studies to determine the mechanism of action of the potentially synergistic anti-tumor activity imparted by omega-3 supplementation. They are conducting these studies with human cancer tissues and cells, human immune cells and animal models to aid with translation to cancer patients. These new results from Kelly and colleagues may represent a new treatment approach that remains to be evaluated in humans.

**More information:** Conference abstract:  
[www.eventscribe.net/2022/EB202...?posterTarget=466274](http://www.eventscribe.net/2022/EB202...?posterTarget=466274)

Provided by Experimental Biology

Citation: Omega-3s could boost immunotherapy's cancer-fighting power (2022, April 1)  
retrieved 5 May 2024 from  
<https://medicalxpress.com/news/2022-04-omega-3s-boost-immunotherapy-cancer-fighting-power.html>

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