No, Asparagus Won't Give You Cancer

By Alex Berezow, PhD — February 8, 2018

One of the top trending Google searches at the time of this writing was "asparagine," one of the roughly 20 amino acids that make up the proteins in our bodies and in our food.

Why was this rather boring molecule that biology majors are forced to memorize grabbing international headlines? Because, according to the media, it causes cancer. And where can you find asparagine? It can be found in any food that contains protein -- which is a lot of foods -- including asparagus, the vegetable after which it was named.

Thus, asparagus causes cancer.

Think I'm joking? I'm not. This headline is from The Times of London:
This article from The Guardian is fairly well explained, but it has an abominable headline:

**Cancer research**

Spread of breast cancer linked to compound in asparagus and other foods

Using drugs or diet to reduce levels of asparagine may benefit patients, say researchers

And this is from Evening Standard:

**Asparagus link to breast cancer is discovered by scientists**

How Does the Media Get Something So Wrong?

What went wrong on, literally, a global scale? Sloppiness combined with a greater desire for eyeballs and ad revenue rather than telling people the truth.

Here is an abridged version of the abstract from the research paper, along with some added emphasis:
"[A]sparagine synthetase expression in a patient’s primary tumour was most strongly correlated with later metastatic relapse. Here we show that asparagine bioavailability strongly influences metastatic potential. Limiting asparagine by knockdown of asparagine synthetase, treatment with L-asparaginase, or dietary asparagine restriction reduces metastasis without affecting growth of the primary tumour, whereas increased dietary asparagine or enforced asparagine synthetase expression promotes metastatic progression."

In English, the abstract says that whether a cancer patient's tumor spreads to other parts of the body is dependent on an enzyme called asparagine synthetase. Our bodies make asparagine, as well as many of the other amino acids that form proteins, and this is one of the enzymes that helps make it. Apparently, the more active this enzyme, the better breast cancer (in this mouse model) is able to spread. That's interesting.

So, the scientists tried a few tricks: They "turned off" the gene encoding the enzyme (using a type of RNA interference), gave the mice an enzyme (asparaginase) that destroys asparagine, or fed the mice a diet that was low in asparagine. In all three cases, the breast cancer was less likely to spread. That's very interesting.

The implications of the research are potentially substantial. There's something about the amino acid asparagine and the enzyme asparagine synthetase that fuels the spread of breast cancer in this mouse model. But this was already known. (More on that below.) Putting patients on a diet low in asparagine is probably not realistic because asparagine is everywhere (and, as mentioned above, our bodies make it, anyway.) Instead, lowering blood levels of asparagine or blocking the enzyme asparagine synthetase in breast tumor cells might be the best path forward.

As it so happens, the former is already a standard medical treatment. Children with acute lymphoblastic leukemia (ALL) are treated with a drug cocktail that includes asparaginase, which lowers the level of asparagine in the blood and in cancer cells.

So, if journalists and editors had done their jobs, headlines should have said something like, "Childhood Leukemia Treatment May Also Work for Breast Cancer," or "Researchers Confirm Enzyme as Potential Target for Breast Cancer Therapy."

The word asparagus isn't even in the original paper. And scientists do not recommend a diet low in asparagine.

Yet, we still got "Laying Off Asparagus May Help Beat Cancer."


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