

Omega-3 fatty acid stops lupus trigger, but how?

June 1 2017, by James Pestka , Sarina Gleason



Credit: Michigan State University

Michigan State University scientists have received a \$2.3 million, five-year National Institutes of Health grant to help uncover why an omega-3 fatty acid, known as DHA, is so effective in stopping a known trigger of lupus.

Previous MSU research has shown that consuming DHA, or docosahexaenoic acid, which is found in fatty, cold-water fish, can stop the onset of [lupus](#) when the [disease](#) is caused by a toxic mineral that's inhaled and typically found around construction, agriculture and mining sites.

It's still unclear, though, how the natural fatty substance prevents the disease from forming.

"When lupus is triggered by fine inhalable particles called crystalline [silica](#) in the lungs, our earlier research has shown that DHA essentially stopped the activation of the disease," said James Pestka, a University Distinguished Professor of food science and human nutrition.

He is leading the new study with MSU co-investigators Jack Harkema, a pulmonary pathologist, and Jenifer Fenton, a nutritional biochemist.

According to Harkema, the DHA could be changing the way these [cells](#) react to the silica in the lungs and somehow stops the immune system from overcompensating and going after healthy cells too.

One theory the researchers have is the DHA could help cells send a signal to the body so it won't overreact and tell the immune system to attack beyond what's needed. Another thought is somehow the DHA allows the cells to swallow up and remove the toxic silica from the lungs without dying, preventing any inflammatory signals from being sent throughout the body.

"Cells in the [lung](#) can gobble up the silica, but it's so toxic, it usually kills these cells," Harkema said. "When they die, signals are sent out to the immune system that something is wrong. The body then produces such a strong response that it also starts killing [healthy cells](#)."

Their earlier research looked at the effect of DHA on lupus lesions in the lungs and kidneys of female mice that were already genetically predisposed to the disease. The results were overwhelmingly positive.

"Ninety-six percent of the lung lesions were stopped with DHA after being triggered by the silica," Harkema said.

Lupus is considered a genetic disease and is activated not only by inhaling toxic particles in the air, but also by other environmental factors such as sun exposure, cigarette smoking, oral contraceptives and postmenopausal hormone therapy.

"Lupus is the body's immune system attacking itself and it can damage any part of the body including skin, joints and organs," Pestka said.

"This new research will let us see what happens at the cellular level in the triggering of lupus and how we can intervene nutritionally with DHA to prevent the flaring and progression of the disease."

Pestka added that the project will also give additional insight on how other respiratory substances more commonly found in the air we breathe, such as diesel exhaust, might trigger the disease.

Provided by Michigan State University

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