

## MMRI gets \$750,000 to research lupus, find avenues for treatment

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The research work of Maria Kontaridis, executive director and Gordon K. Moe professor at the Masonic Medical Research Institute in Utica, has taken an unexpected turn that's letting her fulfill a wish of her late mother.

Kontaridis' work focuses on heart disease and genetics.

"It turns out that the kids I had been studying with a specific group of mutations in one particular gene that caused heart disease was also affecting them in that they were also getting lupus," she said.

Kontaridis' mother was diagnosed with lupus — formally known as systemic lupus erythematosus — in 1986 and died in 2009, in large part from the disease, Kontaridis said.

"She had always asked me when I was going to get back to working on lupus," Kontaridis said.

Now Kontaridis' lab has received a four-year, \$750,000 U.S. Department of Defense Lupus Impact Award to study lupus, one of just 10 labs in the country to get this funding this year.

"I kind of feel that in part this was a gift from her," Kontaridis said.

### About lupus

Lupus is an autoimmune disease that affects between 322,000 and 1.5 million Americans, 90 percent of them women, according to the Lupus and Allied Diseases Association.

It disproportionately affects minorities, including Latino, Hispanic, Black, Asian and Native American people who tend to experience more serious complications and face mortality rates up to three times as high as white people, according to the association.

Lupus causes the immune system, which normally fights infection, to attack healthy tissue instead, leading to inflammation and pain. It can affect the joints and almost any organ system in the body, including skin, the kidneys, the brain, the heart, lungs and blood vessels. It is a leading cause of kidney disease, stroke and heart disease in young women, according to the association.

There is no cure for lupus. Only four drugs have been approved for the treatment of lupus and two for the inflammation of the kidneys often caused by lupus, said Kathleen Arntsen, president and CEO of the Lupus and Allied Diseases Association, which is headquartered in Verona.

So lupus patients are often given treatments approved for other conditions, such as cancer and organ transplants, she said. Many of the drugs used to treat lupus have serious side effects.

"It's actually a very common disorder that affects somewhere around 20 to 100 people per 100,000," Kontaridis said. "Unfortunately it primarily affects women of child-bearing age. And because it's systemic, I used to call it arthritis of the blood because it goes everywhere."

### What's being studied

The change in the gene that Kontaridis has been studying in connection with kids with heart defects looks like it also affects all patients with lupus, she said.

"This became an interest because it was much more globally impactful than we had thought," she said.

The gene, her research discovered, acts in the cells and can increase the amount of T cells, which attack the body, leading to worse outcomes, Kontaridis said.

"If we inhibit this activity of this gene," she said, "we can, in essence, then reduce pathogenic or the deleterious effects on the tissues as a consequence of lupus."

"It won't cure lupus," she added, " but it will prevent it from becoming severe."

Having the gene doesn't by itself cause lupus. It's more like a switch that is activated by an environmental factor, possibly such as ultraviolet light exposure or a viral infection, Kontaridis said.

"That will trigger your immune system to become overreactive because you have the genetic predisposition," she said.

So the research being done by Kontaridis and postdoctoral fellow Samantha Le Sommer will focus on the mechanism that activates that switch and to find ways to stop it.

"We're definitely on the search for a cure," she said.

## **Advocacy**

Given the lack of treatments and dearth of understanding of the cause of lupus, patients lobbied hard for the establishment of the defense department program that awarded a grant to Kontaridis' lab.

The Lupus and Allied Disease Association, which was first founded in Utica in 1978, has been among the patient advocates pushing for more research.

"As a patient-led organization who understands all too well the urgent need for safer and more effective targeted treatments for people struggling to live with diseases of unmet need like lupus, all of us at Lupus and Allied Diseases Association (LADA) are thrilled that there will be local lupus research conducted at the Masonic Medical Research Institute funded by the DOD Lupus Impact Award," Arntsen said. "Not only do we advocate for the DOD Lupus Research Program each year, but we previously funded lupus research at the MMRI from 1990 to 2000."

## **The bigger picture**

Kontaridis' research could end up having impact beyond lupus and the heart defects she started out studying.

The children with the mutations that she studies also are more likely to develop cancer, specifically leukemias. So a treatment to prevent the progression of lupus also could end up helping patients with certain types of cancer, she said.

"My whole career I've spent working in this pathway," Kontaridis said. "That whole time my mom was asking me to work on lupus, I was already working on it."

She could spend another 100 years working and still not have all the answers, she said.

"We uncover more things that we didn't know that we can now help resolve," Kontaridis said. "And it's also a little disheartening because it seems that we can never get to the end."

"I think the remarkable message really," she added, "is that we have to constantly be on the lookout for things. It's like putting pieces of the puzzle together. If you're only looking at one piece, you're never going to see how the bigger picture will turn out."

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