

Zebrafish might hold key to fighting leukemia

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The key to early detection of childhood leukemia might be found in thousands of tiny fish soon to be swimming around in a Wayne State University lab.

The new research project is using zebrafish to identify the genetic and environmental factors that in combination may lead to the development of childhood [leukemia](#). Leukemia is the most common cancer in children and teens, accounting for almost one out of three cancers.

Scientists plan to create WSU's Integrative Biosciences Center and

support of 10 years of pediatric cancer research. The new system will be installed in 2017.

The researchers hope to find out if a common pesticide is a trigger that flips a switch in a specific gene, causing leukemia in children.

First, researchers, with financial support from Kids Without Cancer, were able to breed zebrafish with the human leukemia genes.

"We had so much success with our original support that we saw the potential of additional scientific breakthroughs if we could ramp the research up," said Chris Vandenberg, executive director of Kids Without Cancer.

Now, they are looking for the trigger that causes some children with those genes to develop leukemia and others to not develop it, according to developmental geneticist Ryan Thummel, an assistant professor of anatomy and cell biology in the WSU School of Medicine.

They are using fish that are practically transparent. Researchers can see the spinal column and blood moving throughout the fish. That allows them to quickly notice if the fish has been switched to have leukemia - the fish turns off-white, Thummel said.

There's another reason researchers are using the zebrafish - they are a lot cheaper than the traditional mice used in these types of experiments. A mouse can cost up to \$100 per year, while a fish is a \$1 per year. There's also a number advantage to using the fish. Because a low percentage of fish, and people, with the gene develop leukemia, researchers can introduce various triggers to thousands of fish at a time, letting them study a large number of [fish](#) with the disease at a time.

"Zebrafish can produce thousands of offspring from a single mating

event," Thummel said. "This allows us to screen genetically similar siblings on a very large scale."

The first pesticide to be tested will be propoxur, which is commonly used against grass, forestry and household pests and fleas.

The project grew out of work done in treating children with leukemia by Dr. Jeffrey Taub, chief of oncology at Children's Hospital of Michigan and professor of pediatrics in the WSU School of Medicine. He's searching for ways to identify the possibility children could develop leukemia. He'd like to be able to use blood already taken for newborn screenings to test for the gene and allow doctors to carefully monitor those children and their exposure to whatever trigger is found to help treat the leukemia. So that might mean a young child with the gene might need quarterly monitoring visits with their pediatrician instead of yearly visits.

Environmental toxicologist Tracie Baker, an assistant professor in WSU's institute of environmental health sciences, is joining the research team. She has extensive experience using zebrafish to understand the adverse health effects of exposure to environmental toxins.

The work is being funded by Kids Without Cancer, a nonprofit group of parents whose children have been treated for cancer at Children's Hospital of Michigan. The group has committed \$356,000 to Wayne State University School of Medicine researchers.

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