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FISHING FOR ANSWERS

A Bethesda attorney's quest to make zebrafish central to the study of disease

BY CARALEE ADAMS

TINY ZEBRAFISH DON'T look like scientific heroes. However, the common striped aquarium fish have most of the same organs, tissues and cells as humans, making them good candidates for biomedical research and giving them the potential to do lifesaving work.

Bethesda's Jennifer Manner created a documentary to educate the medical community about the value of using zebrafish in experiments to treat a range of conditions. *Zebrafish: Practically People, Transforming How We Study Disease*, debuted at the National Press Club in

Jennifer Manner became familiar with the promise of zebrafish through her husband, Eric Glasgow (left), who has spent much of his career studying them.



Zebrafish, which have most of the same organs, tissues and cells as humans, are being used in experiments to treat a range of medical conditions.

Washington, D.C., on Jan. 9 to a crowd of roughly 100.

Manner, an attorney, became familiar with the promise of zebrafish as model organisms through her husband, Eric Glasgow, who has devoted much of his career to their study. When the couple first met 30 years ago, Glasgow was in graduate school working on goldfish. He developed an interest in zebrafish at the National Institutes of Health, and is now an assistant professor of medicine, molecular oncology research, and director of the Zebrafish Shared Resource laboratory at Georgetown University.

Over the years, Manner heard Glasgow's stories from the lab about zebrafish. Often on long runs in their Carderock neighborhood after work, Manner would mention a friend battling a health problem, and Glasgow would suggest that research on zebrafish might lead to a cure. "I said that so many times that her response became: 'Yeah, yeah. Zebrafish are the salvation for humankind,'" Glasgow says.

Manner's fascination with zebrafish inspired her to create the company ZScientific in 2008 and the ZScientific

Foundation last year, both of which are focused on supporting research using zebrafish.

After the U.S. presidential election in 2016, Manner became concerned about the country's support for science. "I started to look at how to make a documentary that explains why it makes sense to use this cost-effective, efficient scientific model to be able to do research," says Manner, who enjoys writing and always wanted to try out the medium of film to tell a story.

"I felt it was really important to get the message out. It was very much a passion project," says Manner, senior vice president of regulatory affairs for Englewood, Colorado-based EchoStar Corp., working out of the company's subsidiary office in Germantown.

Since she was new to filmmaking, Manner hired a screenwriter, story editor, associate producer and production company to put together the documentary. As the director and executive producer, she spent nights and weekends working on the 10-minute film, which can be viewed for free at zebrafishfilm.org. Manner plans to

show it at film festivals and scientific meetings.

The film explains how mice are commonly used in drug testing, but zebrafish are less expensive, smaller and easier to observe in a lab. It costs 90 cents a day to keep five mice in a cage, compared with 6.5 cents a day for 70 zebrafish in a tank. Also, mice produce about 300 offspring in a lifetime, while zebrafish produce 9,000. Because zebrafish embryos are transparent, researchers can observe directly how drugs impact their organs, rather than having to get a tissue sample.

Although fish don't seem closely related to humans, they are vertebrates, and gene sequencing has revealed that humans and zebrafish share 70 percent of the same genes. Manner wants scientists to consider zebrafish as a low-cost, high-volume way of figuring out which drugs have the potential to move to the next level of testing and development.

Cancer, diabetes, addiction, Alzheimer's disease, heart disease, Parkinson's disease, epilepsy and autism are all being studied with the help of zebrafish. "It's quite a remarkable organism," says Dr. Leonard Zon, director of the stem cell program at Boston Children's Hospital and the Grousbeck Professor of Pediatric Medicine at Harvard Medical School, referring to zebrafish in the documentary. "We have learned amazing things about organ development from the zebrafish. We also have found new genes that cause human disease, and found new therapies that can be used to treat patients with diseases."

The documentary was shown at the Hollywood International Independent Documentary Film Festival and Austin Spotlight Film Festival in March, and is slated for the Mediterranean Film Festival in Syracuse, Italy, in June. As the word gets out, Manner is optimistic that acceptance of the model will lead to scientific advances. "We are trying to educate," she says. "It's not that fish are better than frogs or better than mice, it's that they should certainly be part of the equation." ■