

Small fish may offer big opportunities for future toxicity testing

By Catherine Sprankle

Scientists from around the world met May 5-6 at North Carolina State University (NCSU) in Raleigh, to consider the key role small fish and fish embryos may play in toxicity testing. Thousands of chemicals are used in industry, agriculture, and consumer products every day, and hundreds more are being developed every year. Yet little is known about how they affect human health. Scientists typically use mice and rats to identify potential health risks of chemicals, but researchers are now considering using other species that would make testing quicker and easier.

International gathering meets local collaboration

The [Collaborative Workshop on Aquatic Models and 21st Century Toxicology](http://ntp.niehs.nih.gov/?objectid=DA6FAB90-9A64-3AA9-AFADDD56190ACB19) (<http://ntp.niehs.nih.gov/?objectid=DA6FAB90-9A64-3AA9-AFADDD56190ACB19>)

drew nearly 150 scientists from the U.S., Canada, Europe, and Asia to discuss the use of small fish or fish embryos in testing to assess chemical safety. A diverse group of scientists from the National Toxicology Program (NTP) Interagency Center for the Evaluation of Alternative Toxicological Methods ([NICEATM](http://ntp.niehs.nih.gov/?objectid=6288C486-CFF1-8A95-D6F2CCED6B6CC819))

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NCSU, Duke University, the U.S. Environmental Protection Agency, and the U.S. Food and Drug Administration (see sidebar), organized the workshop.

Daniel Solomon, Ph.D.,

(<http://sciences.ncsu.edu/about/meet-the-dean/>)

dean of the NCSU College of Sciences, welcomed attendees to the new and technologically advanced **James B. Hunt Jr. Library**

(<http://www.lib.ncsu.edu/huntlibrary>)

on the NCSU campus. Solomon noted the large number of Research Triangle, N.C., area attendees at the workshop in his opening remarks. "Despite the athletic rivalries that exist between our local universities, there are strong collaborations among the researchers, including those working with zebrafish," he said.

NICEATM Director **Warren Casey, Ph.D.,** also welcomed the attendees and remarked that this gathering was part of a larger effort to rethink traditional approaches to toxicology. "We now have the technology to make substantial changes in the way toxicology testing is conducted."

Research, practical advice, data use, and awards

More than 20 scientific talks were given during the two-day workshop, many of them by NIEHS grantees. Presentations included descriptions of research studies and results, practical advice on conducting toxicity studies using small fish and fish embryos, and use of toxicity data derived from aquatic species in drug development and regulatory compliance.

A poster session May 5 allowed attendees to interact informally and learn about other research being conducted. The organizing committee recognized junior researchers from NCSU, Oregon State University, and the University of South Carolina for outstanding presentations.

Participants highlight next steps

The conference concluded May 6 with a discussion session. Workshop participants noted that the suitability of small fish species for toxicity testing, particularly their practical advantages, needs to be brought to the attention of other audiences, including industry, regulators, scientists in other disciplines, and the general public.



In his welcoming remarks, Solomon noted NCSU's strong tradition in biological research, and efforts by NCSU scientists to strengthen the interface between research and medicine. (Photo courtesy of Catherine Sprankle)



Casey provided an overview of how small fish might provide an alternative model for toxicity testing. (Photo courtesy of Catherine Sprankle)

Workshop organizing committee

NIEHS: Casey; Christopher Weis, Ph.D.; Mamta Behl, Ph.D. (contractor); Jonathan Hamm, Ph.D. (contractor)

NCSU: Seth Kullman, Ph.D.; Carolyn Mattingly, Ph.D.; Antonio Planchart, Ph.D.

Duke University: David Hinton, Ph.D.

Environmental Protection Agency: Tamara Tal, Ph.D.

National Center for Toxicological Research, U.S. Food and Drug Administration: Jyotshna Kanungo, Ph.D.

Topics identified for further exploration included the effective application of fish study data for better understanding of chemical safety, and integration of fish data with complementary information from other types of toxicity studies. Other needs included clarification of the relationship between chemical treatment, uptake and metabolism, and the observed effects in fish models.

Attendees agreed that the research presented at the workshop was important and of high quality, and that the event provided a valuable opportunity for researchers within and outside the field of toxicology to share insights on the potential role of small fish and fish embryos in the future of toxicology.

A summary and full report of the workshop will be developed and posted on the workshop Web page, along with presentations and poster abstracts.

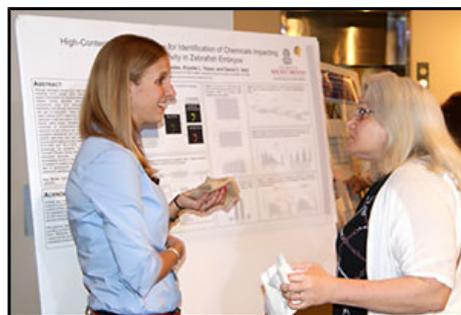
(Catherine Sprankle is a communications specialist with ILS Inc., support contractor for NICEATM.)



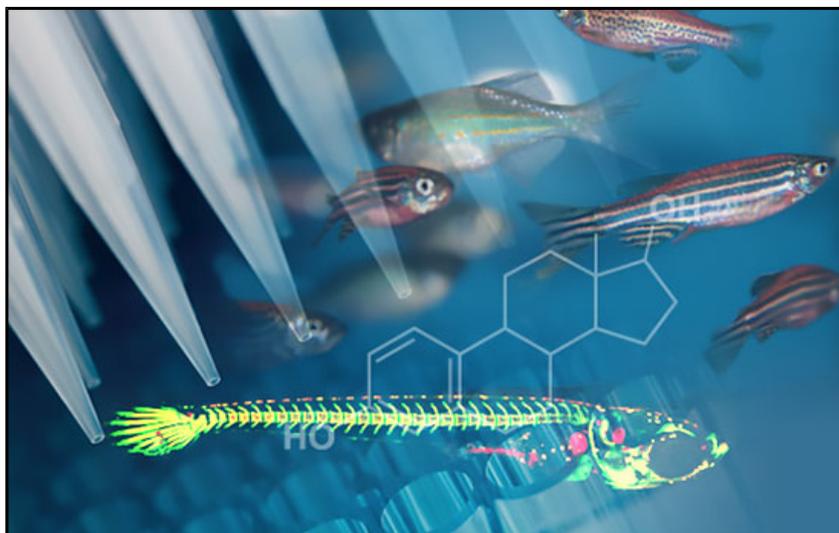
Organizing committee members Mattingly, left, and Behl found a moment to relax during a break. (Photo courtesy of Catherine Sprankle)



The poster by Jennifer Panlilio, right, a graduate student at Woods Hole Oceanographic Institution, sparked a discussion with workshop presenters Jeff Bronstein, M.D., Ph.D., of the University of California, Los Angeles, left, and Matthew Winter, Ph.D., of the University of Exeter. (Photo courtesy of Catherine Sprankle)



Tara Raftery, left, a graduate student working with NIEHS grantee David Volz, Ph.D., at the University of South Carolina, answered many questions from attendees during the workshop's poster session. Raftery's poster was recognized as one of three outstanding student presentations at the workshop. (Photo courtesy of Catherine Sprankle)



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