What can we learn from zebrafish about human blood disorders?

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Genetic regulation of the various types of blood cells in zebrafish and humans is highly similar, making it relatively easy and cost-effective to perform genetic, chemical, imaging and other molecular studies on this invaluable model organism to study normal hematopoetic development in humans as well as blood disorders and malignancies, as described in a Review article in *Human Gene Therapy*.

Serine Avagyan and Leonard Zon, Boston Children's Hospital, Dana-Farber Cancer Institute, and Harvard Medical School (Boston, MA) and

Harvard University (Cambridge, MA), examine the major discoveries that have helped define molecular control of hematopoiesis in vertebrates, highlighting the knowledge gained from studies of zebrafish.

In the article "Fish to Learn: Insights into Blood Development and Blood Disorders from Zebrafish Hematopoiesis," the authors discuss the unique attributes of zebrafish that make it useful as a model system for performing large-scale forward genetic screens to silence or over-express target genes to determine their function, chemical screens, live imaging of blood system development at the single cell level, and modeling of hematopoetic disorders and malignancies by inserting human genes to create transgenic zebrafish.

This article is part of a Festschrift in honor of George Stamatoyannopoulous, MD, DrSci, Professor of Medicine and Genome Sciences, and Director, Markey Molecular Medicine Center, University of Washington, Seattle.

"Zebrafish have proven to be an extremely powerful model for understanding developmental biology, including the developmental biology of blood-forming tissues," says Editor-in-Chief Terence R. Flotte, MD, Celia and Isaac Haidak Professor of Medical Education and Dean, Provost, and Executive Deputy Chancellor, University of Massachusetts Medical School, Worcester, MA. "The review from the Zon laboratory beautifully illustrates how critical such studies have been to broader progress in biomedicine, as has long been envisioned by pioneers of molecular medicine like Dr. George Stamatoyannopoulous."

More information: Serine Avagyan et al, Fish to Learn: Insights into Blood Development and Blood Disorders from Zebrafish Hematopoiesis, *Human Gene Therapy* (2016). DOI: 10.1089/hum.2016.024