

Largest genetic atlas for zebrafish 'breakthrough' for biomedical research

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Medical and life science researchers will benefit from the most comprehensive atlas yet of genetic data on zebrafish, newly published research suggests.

The atlas will help researchers to better study conditions from various types of cancer (e.g. skin cancer), [heart disease](#), and neurodegeneration. It may help more researchers to replace mammal models in their studies.

The DANIO-CODE consortium, a nationwide team of 27 laboratories, worked together to catalog published open-access datasets compensated with newly produced data. The effort resulted in 140,000 regions of DNA involved in regulating [gene expression](#) in zebrafish.

The study looking at zebrafish, the second most-used [animal model](#) for medical and [life sciences](#) research, draws on 1,802 samples with millions of [data points](#) each and provides the broadest picture of candidate DNA regions for transgenic breeding and [genetic research](#) into development and diseases.

Appearing in *Nature Genetics* today, the paper details DNA elements involved in several embryonic stages of development, and improvements to an understanding of the genetic equivalence between zebrafish and mice.

Ferenc Mueller, Professor of Developmental Genetics at the University of Birmingham who led the consortium of this study, said:

"The cataloging of genetic information for zebrafish is a significant breakthrough that could underpin some of the most exciting medical and life sciences developments for years to come.

"Professor Boris Lenhard from Imperial College London and Professor Carsten Daub from Karolinska Institutet have been instrumental in coordinating over 50 researchers worldwide. The resulting atlas/map is a testament to how a bottom-up initiative for collaborating across borders can achieve impact for the benefit of our research community. The catalog created by the DANIO-CODE consortium is open access to

ensure that researchers can utilize the genetic information for their future studies.

"Zebrafish are an incredibly beneficial model for researchers. They are ideal candidates for studying various diseases and disorders because they grow transparently as embryos and have unusual regenerative properties. These properties have already given researchers insights into the [human condition](#).

"Now, with our new catalog, we move one step closer to having a fully realized map from which to overlay with the human genome. This kind of activity will allow researchers around the world to pursue at pace novel treatments, drugs, and a better understanding of the human and animal disease."

Carsten Daub, Associate Professor and Group Leader, Department of Biosciences and Nutrition (KI) and Science for Life Laboratory at Karolinska Institutet who led the data integration said:

"This extensive study consolidates all individual datasets into one framework allowing researchers across the world to address questions which could not be addressed by the individual studies."

More information: Carsten Daub, Multiomic atlas with functional stratification and developmental dynamics of zebrafish cis-regulatory elements, *Nature Genetics* (2022). [DOI: 10.1038/s41588-022-01089-w](https://doi.org/10.1038/s41588-022-01089-w). www.nature.com/articles/s41588-022-01089-w

Provided by University of Birmingham

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