Researchers improve method to map brain cell connectivity in zebrafish
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Virginia Tech scientists have improved their method to map the zebrafish brain—an advance that could improve understanding of how the human brain functions. Credit: Albert Pan for Virginia Tech

Nine-day-old zebrafish with labeled retinor-recipient neurons (rainbow pseudocolored). Unlabeled neurons are overlayed in gray. Virginia Tech scientists have improved their method to map the zebrafish brain—a...
activity during visual stimulation. Furthermore, this technique can also define the neuron type, for example, if the neuron during a visual stimulus is an excitatory neuron or an inhibitory neuron.”

Stanislav Kler, a virologist and co-lead author of the study who was also a postdoctoral research associate in the lab, said, "The connectivity patterns between most neuronal types are mostly unknown. This gap in knowledge underscores the critical need for effective neural circuit mapping tools. This will get us a step closer to understanding how the brain stores and processes information and how we can manipulate these circuits for better health."

The research is especially significant for vision research.

"To restore vision after diseases or injury that affect the eye itself including the cells in the eye that project to structures deep within the brain for subsequent processing of the visual world, the eye needs to connect to the right places in the brain," said Pan, who is a member of the Fralin Biomedical Research Institute’s Center for Neurobiology Research. "The small size and translucency of larval zebrafish are a unique experimental system to investigate whole brain neural circuits. Scientists working on vision regeneration can now look at whether there is functional connectivity."