

Fish show autism-like gene expression in water with psychoactive pharmaceuticals

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Psychoactive medications in water affect the gene expression profiles of fathead minnows in a way that mimics the gene expression patterns associated with autism spectrum disorder in genetically susceptible humans, according to research published June 6 in the open access journal *PLoS ONE*. These results suggest a potential environmental trigger for autism spectrum disorder in this vulnerable population, the authors write.

The researchers, led by Michael A. Thomas of Idaho State University, exposed the fish to three psychoactive pharmaceuticals – fluoxetine, a selective serotonin reuptake inhibitor, or SSR1; venlafaxine, a serotonin-norepinephrine reuptake inhibitor, and carbamazepine, used to control seizures – at concentrations comparable to the highest estimated environmental levels.

They found that the only [gene expression patterns](#) affected were those associated with idiopathic autism spectrum disorders, caused by genetic susceptibility interacting with unknown environmental triggers. These results suggest that exposure to environmental psychoactive pharmaceuticals may play a role in the development of [autism spectrum disorder](#) in genetically predisposed individuals.

Lead researcher Michael A. Thomas remarks, "While others have envisioned a causal role for psychotropic drugs in idiopathic autism, we were astonished to find evidence that this might occur at very low dosages, such as those found in aquatic systems."

More information: Thomas MA, Klaper RD (2012) Psychoactive Pharmaceuticals Induce Fish Gene Expression Profiles Associated with Human Idiopathic Autism. *PLoS ONE* 7(6): e32917.

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