

## **Quantitative characterization of zebrafish behavior: Learning performance and fear responses**

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The zebrafish has been utilized particularly successfully in high throughput screening including forward genetics and drug screens. Such screens can tackle complex biological problems and unravel underlying molecular mechanisms. Although learning and memory have been extensively studied, only a fraction of genes involved have been discovered. This has medical implications. There may be thousands of undiscovered molecular targets that may be utilized for memory improvement. Similarly, human anxiety disorders represent a large unmet medical need and the mechanisms of these disorders are still not understood. Some have proposed zebrafish as an appropriate tool for the modeling and mechanistic analysis of these complex behavioral phenomena. The main limitation for the use of zebrafish in this research, however, is the paucity of appropriate behavioral test paradigms and lack of characterization of the cognitive, mnemonic abilities and fear responses of this species. I present behavioral paradigms that quantify forms of learning and phases of memory or different aspects of fear. Many of these tests are automated and thus have utility in high throughput screening. Although behavioral characterization of zebrafish is just starting, I argue that this species has a bright future in the analysis of biological mechanisms of complex behavioral and brain functions