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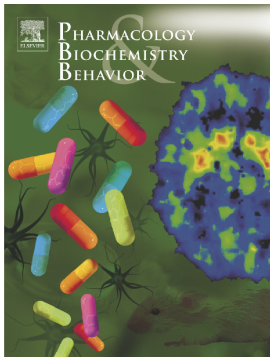

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Dopaminergic control of anxiety in young and aged zebrafish

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Abstract

Changes in the expression of the dopamine transporter (DAT), or the sensitivity of dopamine receptors, are associated with aging and substance abuse and may underlie some of the symptoms common to both conditions. In this study, we explored the role of the dopaminergic system in the anxiogenic effects of aging and acute cocaine exposure by comparing the behavioral phenotypes of wildtype (WT) and DAT knockout zebrafish (DAT-KO) of different ages. To determine the involvement of specific dopamine receptors in anxiety states, antagonists to D1 (SCH23390) and D2/D3 (sulpiride) were employed. We established that DAT-KO results in a chronic anxiety-like state, seen as an increase in bottom-dwelling and thigmotaxis. Similar effects were produced by aging and acute cocaine administration, both leading to reduction in DAT mRNA abundance (qPCR).