

Neurotransmitter Systems in Zebrafish Model as a Target for Neurobehavioural Studies †

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Abstract: Neurobiology has focused on understanding the functional and structural properties of the brain and their ties to various toxicological and pathological processes. There has been a surge of interest in studying stress-induced manifestations in the last 20 decades, which has led to the development of more viable animal models for stress-associated pathology and its therapeutic treatment. To understand the neurochemical changes underlying stress, the study of neurotransmitters and their mechanism of action is required. Signaling by neurotransmitters controls quick intercellular communication through the activation of secondary messenger systems and regulation of ion channels. There are physical and ethical problems with performing experiments on human patients; researchers have focused on using model organisms to study biological processes conserved between humans and lower vertebrates. Nowadays, Zebrafish have been used as an animal model for neurological research due to their genetic tractability and ease of maintenance. These features make this species a versatile tool for drug discovery and neurobehavioural investigation. In this review, the major neurotransmitter systems are examined, including GABA, dopamine, serotonin, acetylcholine, histamine, glycine, glutamate, and pathways of synthesis, transport, metabolism, and action. Recent studies on neurotransmitters and their effect on the neurobehavioural aspect of Zebrafish provide insight into normal brain functioning and pathophysiology and possible treatments for stress-related neuropsychiatric disorders. As zebrafish knowledge of neurotransmitter systems increases and pharmacological and toxicological aspects of these systems are elucidated, new strategies and research priorities will become available to better understand neuropsychiatric disorders.

Keywords: neurotransmitters; Zebrafish; dopamine; serotonin; acetylcholine; GABA; neurobehaviour.

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Conflicts of Interest

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